AN APOLOGY FOR THE BATH.

BEING

An ANSWER to a late Enquiry *into the Right Use and Abuses of the* BATHS in ENGLAND, so far as may concern the Hot Waters of the BATH in the County of SOMERSET.

WITH

Some Reflections on *Fresh Cold-Bathing*, *Bathing in Sea-Water*, and *Dipping in Baptism*.

In a Letter to a Friend.

By the Author of the Latin Tract, *De Thermis Britannicis.* Tho. Guidot.

Avicen. Can. 4. Fen. 1. Cremonensi Interprete.
Omnis Contradictor, imprimis cùm est super Veritate, excusatus est.

LONDON; Printed for *G. Sawbridg*, at the three *Flower-de-luces* in *Little-Britain*. 1705.

MVSEVM
BRITAN
NICVM

Inclyti Medicorum Londinensium
Collegi Regalis
PRÆSIDI Dignissimo
D. D. Edvardo Brown,
Doctissimo Viro
D. Thomæ Brown,
Eq. Aur. F.
Una cum
Censoribus Eruditis, &
Practico Eximio,
D. Wilhelmo Gibbons;
Hanc pro
Thermis Bathonensibus
Apologiam,
Lubens merito
Dicat Consecratque

Author T. G.

QUI *aliquid ſtatuit, parte inaudita altera, Æquum licet ſtatuerit, haud Æquus fuerit.* Non dedignabitur itaque bene ſcio Humanitas Veſtra acuto adeo Judicio & Cenſura ſtipata oculum in Examen hoc modeſtum benignum conjicere, præſertim cùm Apologiam Tuæ Excellentiæ, Domine PRÆSES (Amice plurimum Honorande) nuncupandi cauſa cogens comparuit, quod ea ferme omnia quæ ſequentes Pagellæ protegunt & defendunt Μαναείτης Anteceſſor Tuus ὁ πάνυ (Miles) mihi primus in lucem proferendi præbuiſſet anſam; & doctiſſimi Epiſcopi *Norvicenſis* authoritas, magna apud me, jubet mandatque. Dabam Aquis calidis in Magnæ Britanniæ Comitatu Somerſetenſi Anno Æræ CHRISTI M. DCC. IV. Raptim, & Paucis, ne Patientiam Veſtram ſeſquipedati Epiſtola iniquius Violarem, quos in Thermarum Britannicarum Approbatione,

batione, haud ita pridem æquissimos habueram. Valete Viri Celeberrimi, & Aquas Calidas quas amâstis olim, olim iterum Amore & Favore Vestro ornare Dignemini.

Epistola Nuncupatoria.

THE PREFACE TO THE Candid Reader.

WHEN Minerva, *as the Poets fancy, made a Bath for* Hercules, *and both became the Deitys of all the Baths in the World, we were then taught, kind Reader, what we ſtill find true,* That Bathing is of great uſe after hard Labour, and mightily refreſheth all weary Perſons. *But the Luxury of the* Romans *in after Ages grew great and exorbitant in ſtately Buildings, Ornaments, and pompous Dedications, as* Dio *and* Suetonius, *in the Lives of* Nero *and* Titus, *give ſome account; and* Martial *wittily ſays,*

Neronianas hic refrigeret Thermas.

After that, in the time of Diocleſian, *the* Roman *Baths were more ſtately and numerous; and in the time of* Antonine, *what pertain'd to 'em, reſembl'd a little Province, incredible to any that do not conſider, that* Rome *in its Glory, as* Antonius Thyſius *before* Roma Illuſtrata *relates, took up in City and Suburbs more than forty miles, contain'd eighty hundred thouſand Perſons, and had above four hundred Temples. Theſe Artificial Baths, chiefly for Pleaſure and Delight, were much frequented, with the Natural of* Baiæ *in* Campaniâ, *by the chiefeſt in* Rome; *of which* Strabo, *lib. 5. relates, that they were* [ὑδατα θερμα ἡ πρὸς τὴν τρύφην, ἡ πρὸς θεραπειαν νόσων ἐπιτήδεια] of great uſe not only for Delight and Pleaſure, but the Cure of Diſeaſes. *That our natural Hot Baths in* Britain *dedicated to* Minerva, *were known to the* Romans, *is plain from an authentick* Roman *Hiſtorian, whoſe Age, in my Antiquitys of* Bath, *I put much lower than common Chronology; and the carved Stone-Arches, in the King's Bath, ſeem to be* Roman, *as appears by that expreſſion of* Solinus, *where he writes, that the* Fontes Calidi, *or the hot Springs, in* Britain *(then) were* opparo excultî apparatu; *not* exculti, *as is uſually read, noted for their Sculpture, not the Ornament, which was nothing before the generous Gift of that great Benefactor Sir* Francis Stonor, *in the Year* 1624. *Upon this the* Romans *might have*

had a longer Station here, as their Coins and Inscriptions, elsewhere taken notice of and explain'd, do evince. Now, tho cold Water, and Water gently heated by Fire, was often us'd by Persons affecting Delicacy and Delight; yet a greater degree of Heat was ever thought necessary for the Cure of most Diseases: in pursuit of which, no doubt, as well as drinking the Water, many have been, and now are irregular. The long Experience and peculiar Knowledg I have had of the Hot Waters of the Bath, with the kind Respect and great Applications made and receiv'd from the Users and Favourers of the same in former times, have drawn from me these few Remarks, more to maintain what, at the request of the most Excellent Sir Thomas Millington, late President of the Physicians College Royal in London, I have already written, than out of any desire again to appear in Print; partly to explain and compare Observations, and in part to rectify, if any thing be amiss, for the further use and greater benefit of Sickly Persons at the Bath: In which, as I have been as tender of the Repute of Learned Men at Home, as the matter won'd bear; so I thought my self oblig'd to do the Right was deservedly due to some eminent Physicians Abroad, from whom I had received so great Respect, not only in our own Country, but in other Nations, particularly High Germany, Holland, Denmark and Sweden, as their Epistles make manifest. And if I have here

and

and there intermix'd some Digressions, I have done but the same thing the most Learned Sir George Ent *did before, when he answer'd the Crudities of* Parisanus, *against the Circulation of the Renown'd Dr.* Harvey, *as I shall have occasion afterwards in this Apology to remind the Reader, in a Digression against* Riolan, *who with greater insolence treated Dr.* Harvey, *and his Learned Friend Dr.* Highmore *on the same Subject. What remains, is only the consideration of the more curious Researches I have made into the Motion, Nature and Parts of the Blood, and other Juices contain'd in it; the Passage of the* Bath-water *and all Liquids, from the Mouth to the Kidneys; and it may be a shorter Passage discover'd of Potulents in general, as well as Mineral Waters to the Bladder, which perhaps upon further search, on this Intimation, may be generally receiv'd, consonant to an Observation made in human Dissection, by the Eminent Dr.* Thomas Bartholin, *late Anatomy Professor at* Copenhagen, *advanc'd and encourag'd by that great Promoter of Learning, and Patron of Learned Men, King* FREDERIC III. *Which seems to me to be the only Help we may ever have from Nature on that account; since we cannot now expect a Demonstration from the late great Physician at* Blandford *in the County of* Dorset, *who, in an Epistle to me, dated* Aug. 6. 1694. *was of Opinion, analogous to that of* Blancardus *in the Circulation,* Materiam potulentam copiosè ingurgitatam,

gurgitatam, per canales e fundo ventriculi prodeuntes, ea qua omento conjungitur regione, ſine mora, pergere ad emulgentes. *The ſame Perſon having formerly often urged me, to publiſh what I knew* de Thermis Britannicis, *hath again been earneſt with me to make publick my Thoughts of the Paſſages of Urine.* Ductuum Urinariorum deſcriptionem, ex medicis Tuis obſervationibus, & potulentorum tranſitu ad renes, quam te publici juris facturum dudum promiſiſti, avidus expecto: Breviorem eſſe Viam, quam te ſolerter rimantem inveniſſe ſpero, innuit, & indigitat, congiorum plurium redditio quaſi extemporanea, ſine diabete, quibuſdam, iiſque ſobriis, prout a Viris audivi Londini, Oxonii, & alibi. Ingenii tui prolem, noli quæſo ulterius Muſæo tuo incluſam, damno publico detinere, ſed eruditorum oculis te ſubjicere peramanter oro. *I have had many other Solicitations from Learned Phyſicians at home and abroad, to whom I have return'd Anſwer in my* Conſilia, Obſervationes, & Epiſtolæ Medicinales, *not yet made publick. But what is chiefly to be conſider'd in the preſent Apology, is what is farther added for the better Information of a Perſon Learned and Ingenious, Author of a late Diſcourſe concerning* the right Uſe and Abuſes of the Baths in ENGLAND, *againſt* Nitrum calcarium, *and a ſubterranean Fire, the too long reputed Cauſe of the Heat of the Bath; to the unex-*

unexpected frightful Ghost of which in this strange Apparition, I thought fit to speak, to give greater Illustration and Strength to what I have formerly urg'd against it, in the larger Prints of Thermæ Britannicæ, now reviv'd and better explain'd, in a Letter to the Reverend and my Worthy Friend, the present Archdeacon and Rector of Bath; in which I have consider'd the most material Objections and Reflections on these hot Springs, formerly publish'd by the noble Author, in order to advance the Credit and Reputation of colder Waters in other Places, beyond their Merit, and Possibility of doing good, my more than what respects Self-Interest and a private Concern. And altho, notwithstanding the great Pother has been lately made about Alkaly and Acid, as the two Hemisphæres and grand Hinges of the practical part of Medicine, or rather Deus & Diabolus, Preserver and Destroyer of Mankind (the Vanity of which deluding popular Notion, Dr. Andry hath sufficiently shewn and expos'd in his late Discourse of Worms) I have still great reason to maintain a good Opinion of the antient method of Physick, by the help of which I have perform'd so many considerable Cures; yet I am much inclin'd to think, that Medicines in solid Form, have chiefly respect to the Stomach and Intestines, where they for the most part rest, till farther distributed by convenient Liquids: whereas the more inward Distempers of the Viscera and Blood, are soon reach'd by Quantitys of Liquids,

quids, taken in due time after Solids; which makes the Bath-water a better Vehicle to what is mix'd with it, or 'tis affused on, than a Medicine, or sufficient Remedy of it self, and exceeds and excuseth most Decoctions and Juleps, that are commonly prescribed in lesser proportion. To give a greater Lustre to the Bath, and drinking the Water in a regular manner, I may here affirm, That the FOUNTAIN of Honor, many honorable Persons and Persons of Quality, have experimented the contrary of some things contain'd in this Enquiry; in particular, That the Cross Bath is much too hot for a temperate Bath; *and* that the Water of all the Baths in Potion heats the Body so, as to cause Defluctions, with the several kinds thereof, Rheumatism, Gout, Consumption, &c. *When the Sulphur so admirably dissolved naturally in the chyme of the Waters, as to become fluid, and inoffensive both to Smell and Tast, which no Art can attain unto, or incorporate so again, hath render'd this Hot Water so amicable and balsamick, that in conjunction with Niter, it penetrates the most intimate recesses of the Body in general; and the Lungs in particular; by the use of which all Persons in such Distempers, may reasonably expect much greater advantage, than from any cold Mineral Water or Spaw whatsoever. Which to me is easier to believe, than that* Alexander Severus, *the* Roman *Emperor, was ever in* Britain; *or that* Constantine the Great

Pag. 9.

Pag. 40.

was a Leper, and cured by being baptized in a Pond by Sylveſter *the Pope: when the beſt Hiſtorians,* Rufinus, Pomponius, Oroſius, Eutropius, Caſſiodorus, *and the Tripartite Hiſtory allow it to be done by* Euſebius, *not* Cæſarienſis, *but Biſhop of* Nicomedia, *where he happen'd to die in his way to* Jeruſalem, *and the River* Jordan. *The Author's own words are theſe,* Conſtantine was cur'd of his Leproſy by his Baptiſm in the Pond he ſaw in his Viſion, in which Pope *Sylveſter* afterwards *Dipped* him. *The like Error is committed in the ſame Page as to* Clodoveus *the firſt Chriſtian King of* France, *whom* Gregory Turonenſis *calls* Novus Conſtantinus, *and is ſaid to have bin a Leper, cur'd by* Dipping-Baptiſm *by the ſame Perſon, the Year in the Margin* 499, *the time of* Symmachus, *according to* Platina, *when* Conſtantine *dy'd* 336. *Beſides, the* French *Hiſtory, done by a better hand, after the Story of that King's vowing to be a Chriſtian, on the Succeſs of Battel, in the* Engliſh *words of* Edward Grimſtone's *Tranſlation, ſays no more than this:* So (then) *Clovis* was baptiz'd at *Rheims,* by St. *Remy* (Biſhop of *Rheims*) with great Solemnity; *and ſays, that* Gregory *of* Tours *ſays, no more than that Clovis* was baptized; *without the Dove that brought in her Bill a Viol of Oil, with which their Kings have been anointed ever ſince. Whether Philoſophy holds pace with Hiſtory is our next Enquiry, which I intend*

Cold Bathing, p. 74.

ſhall

ſhall be very ſhort, in regard ſhou'd I longer inſiſt on Paradox, Novel Opinion, and rotten Authority, I ſhou'd be no better than an idle Boy that admires and tires himſelf in purſuit of a painted Fly, to avoid harder Work. And 'tis one of the bleſſed Effects of the late Revolution, that People ſince, more than ever, ſtudy ſaving *Knowledg, and how to live eaſy and* cheap, *upon a common Level; as moſt do now on that other, turn from the antient way of Bathing, to the new Mode of Drinking the Water at the* Bath. *I ſhall only further acquaint the Candid Reader, that I have made this Apology for the Hot Baths, with the ſame Mind, as* Cornelius Tacitus *ſays he writ his Annals,* ſine ira, & partium ſtudio, quorum cauſas procul habeo. *And all I ſhall trouble the Reader with in the Preface more, is what he may read in the Imperial Hiſtory, in the Life of* Conſtantine the Great, *That* whereas it is written in a little Book, that *Conſtantine* was infected with a Leproſy, and cured (not by Dipping in a Pond, but) with the Blood of little Children, he caus'd to be ſlain for that purpoſe; *Platina* holdeth this for a forg'd Fable, and no Writer of any Credit, Antient or Modern, writes any ſuch matter. *And 'tis no way probable, that* Conſtantine *was baptized by* Sylveſter, *who had no better repute than that of a Magician; tho* Caranza *in his*

P. 788. *Summary of the* Councils, *corrupts the Text, and for* Magus *puts* Magnus, *in favour of that Pope. Others again, to avoid the Scandal or Blemish, as some may think it, of* Constantine's *being baptized by an* Arian, *allow him to die before he came to* Bithynia.

An Answer, &c.

SIR,

THE *Raritys* of *Nature* in the *North* of *ENGLAND*, having had a share of our *former* Converse, and some *Discourses* happening about *Buxton-Wells* in the County of *Derby*, and the Author of a *late* Treatise concerning the right *Use* and *Abuses* of the *Baths* in *ENGLAND*; the Design of which was to set up *Colder* Waters in *greater* opposition to the *Hot* Baths, than the thing will bear: I thought fit to take the *same* measures with that, the *inquisitive* Author prescribes to the *Drinkers* of the Waters of the *Bath*, not to take it *too* hot from the *Pump*, but suffer it to *cool* a little, that so the *Gas* may not offend the *Head*. Pag. 63.

After *this* Enquiry had enjoy'd a *convenient* Familiarity with mine *other* Books, and made his *Complement* becoming the *Gravity* of more antient *Authors* on the *same* Subject, at *leisure* hours I *read* it over, and *found*,

Πολλὰ μὲν ἔσθλα μεμιγμένα, πολλὰ δὲ λυγρά.

Many good Obſervations, *Collections* and Hints from *others*; ſome *new* Notions with very much eaſe *introduc'd* and advanc'd, and ſome *old* Opinions too ſtifly *adher'd* to, and *maintain'd* without *proof*. A pretty *Laconic* way of writing, conciſe and *magiſterial*, outdoes *Pythagoras* and *Peter Lombard*, the Maſters of *that* Art. Indeed when I read the *Preface*, I did not think ſo much on the *Gates* of *Mindus*, as the ſtately *Portopylæum* of a curious Edifice.

Amphora cœpit inſtitui, cur Urceus exit?

The Doctrine of *Perſpiration* is a moſt *noble* Subject, and requires more *exact* Thoughts and Conſideration about it: A *Doctrine* hath been a long time *conceal'd*, and wou'd have lain longer *hid*, had not the famous *Sanctorius* reſcu'd it from the *Obſcurity* it was in, and ſo *advantageouſly* propos'd it to the *publick* view; which *this* Author hath ſo *excellently* cultivated, that I hope it will be a means of *further* Eſſays, and more *Experiments* on ſo exalted a *Theme*, on which the Cure of *Fevers*, and many Diſeaſes of the *Blood* and other *Juices* do chiefly depend: and *this* Point being ſo *well* handled by the *ingenious* Author, 'tis adviſable he more ſeriouſly conſider, whether

whether a *Cold Bath*, which stops the *Pores*, and hinders *Transpiration*, can be of that *general* use, as in *this*, and some *other* Writings since he wou'd have it to be; which probably may have no better effects in perspirable Bodies, than lying on the *Cold Ground*, or admitting *Cold* Air, which the Country People call *catching Cold*.

The *Calor Nativus*, or *calidum innatum, & humidum radicale* of the *antient* Philosophers and *Physicians* (which I think we cannot *better* understand, than by the *Heat* of the *Blood*, and the Juice we call *Nutritive*, it being a known Maxim among 'em, *That we are nourish'd by the like matter of which we are made*) will be further illustrated by a *greater* search into this grand *arcanum*: and as the *invisible* World, as an Heavenly *Prelate* formerly taught us in a *Book* of that Nature, both in Space and Inhabitants *far* exceeds the *visible*; so the invisible Evacuations outpass *all* the visible, and the accelerating or impeding the *invisible* Steam, commonly call'd *insensible* Perspiration, by bathing or *otherwise*, I judg will prove the *surest* Hinge, and much more considerable than that of *Alkalys* and *Acids*, the Preservation of Health, and curing *many* Diseases will turn upon.

Iisdem nutrimur ex quibus constamus.

Jos. Hall *late Bp of* Norwich.

I confess an *Ignis fatuus* abroad, to which the milder vital *Flame* is compar'd

by a *great* Person; and some *wisped* men at home, of *prime* rank in the *College* of Physicians, have *endeavour'd* to persuade the World, that every Man is a *dark Lanthorn*, or, humanly speaking, hath a *Light within*; tho *Cæsar Cremoninus*, and *Hermannus Conringius*, two grand *Sticklers* for their Master *Aristotle* against *Galen*, go no further than a moderate Heat, to which *Conringius* gives the name of *Fire*, and something *like* a Flame, that doth not shine nor give any *Light*: but this Notion is so *wild* and extravagant, that notwithstanding the *best* Props *Ernestus Burgravius*, his excellent Second Sir *George Ent*, the famous Dr. *Willis*, and that great Physician and Anatomist of his time Dr. *Lower* cou'd afford it, like a *false* Star 'tis fallen to the Ground, and the *Light* that was never kindled but in their own *fanciful* Thoughts, is so far *extinguish'd*, as never like to *perplex* the World again, how it cou'd be maintain'd without *Air*, or not break forth thro the *Spiracula* of the Mouth, *Nose*, and Ears, having so advantageous a *Tunnel* as the rough Artery or *Wind-pipe* so commodiously sited, and dissleminated thro the *Lungs*; as is related by an *eminent* Physician, to have been *sometime* observ'd in a great Drinker of *Brandy* and *Aqua vitæ* (then *Aqua mortis*) who after a contending *Debauch*, the strong spirituous Liquor taking *Fire* in the Stomach, *died*;

De calido innato. c. 1. De calore nativo. c. 4.

Car. Piso de Morb. Seres. Lug. Bat. 1650. p. 511. in obs. de aq. vitæ liberali potu exanim.

Anima

Anima una cum flamma ex Ore & Naribus erumpente; *Rendering his Soul in Flames of Fire, iſſuing out thro his Noſtrils and Mouth*; or what is *conſequential* to it, cauſe a *Peripneumonia*, or Inflammation of the *Lungs*, being ſo *near* a Neighbour to the *Flame* it ſelf.

Nay, *ſome* Phyſicians I find ſo *ſtrangely* fond of this notion of a vital *Flame*, that they not only believe it *reſident* in the *Heart*, but mix'd with our Aliment: as Dr. *Bennet*, *Tabid. Theatr. p.* 1. where he mentions *Flammula expandens*; and *p.* 11. *ignicula naturalia*, as generally diffus'd thro all the parts of the Body, the *extinction* of which they make the Cauſe of a *Gangreen*, with greater probability attributable to the loſs and *deſtruction* of a plain *Heat*, that by means of a *Fermentation* is contain'd in, or *deriv'd* from the *Blood* in Animals, and the nutritive Juice in *Fruit* and *Trees*, when they come to be *rotten*; by which the common appearances admit a better *Solution* than *Fire* can pretend to. Conſonant to this *Cremoninus* ſaith, nothing can *live* or be nouriſh'd without *this* Heat, and placeth the *Calidum innatum* in the *Temperament* of mixt Bodies; in which by reaſon of *Contradiction*, as he calls it (which the Lord *Verulam* in his *novum organum*, ſtiles *conflictus corporum*, a Fight or *Combat* of Bodies, to which he attributes the heat of *hot* Baths,

Dr. Morton *and others.*

where the *Fire* is not visible) there is *Action* and *Passion*: That this Heat is generated, he says, by the Heat of the *Temperament* of the *Heart*, in the Transmutation, and *several* Concoctions, and Distribution of our *Food*; and from the *Heart* is sent out by the Spirits and *Blood* into all the parts of the *Body*: than which, bating a little fondness to the *Heart*, nothing can come nearer to a *Fermentation*; which, probably before the *Heart* exists, begins in the *Womb* or Egg (where the late Oracle in Physick, Sir *George Ent*, is of Opinion, the *vital* Spirit in the *imperfect* Heart, in the matter of the *Fœtus* (without the help of any spermatick Worms) doth *pluisculum effervescere*, and that *post diuturnam cum sanguine fermentationem*) gives an *Heat*, but without a *Flame* to the Blood, with which it is *connate*, fitable to the nourishment of the *Embryo*, as then it is, which afterwards *increaseth* as Age comes on, and *Variety* of Aliments makes a *further* Supply. I do not deny but the *pre-existent* matter of the Blood, as the Water of *Hot* Baths, may be *cold* at first, and receive *Heat* from a *Fermentation*; which Heat it retains as long as it continues *animate* in the Body, and admits fresh *Recruits*, and Refocillation from *new* matter, which it cannot do when *extravas'd*, and therefore returns to its *pristin* Temper. And altho a great *deference* is due to the

Digress. contra Parisanum. p. 183.

Heart,

Heart, as a noble *Viscus* in the Body, for other *excellent* uses; yet I will venture to say, that the *Walls* of the Bath may as well in a *manner* be suppos'd to give the *first* Heat to the Water, as the Heart to the *Blood*, which it *aptly* receives, and *wonderfully* dispenseth out to the *rest* of the Body, by its *Glory*, its Motion, and that *natural* Pump, the Pulse. The Heart seeming to me to be *chiefly* design'd for a *Condus promus*, *a le despencer*, or *Steward* to the whole; which preserves and *increaseth* the Heat in the *Blood*, begun and continu'd by a *Fermentation*, which raiseth a greater *Heat* than any *Ignis fatuus* can do; *beneath* the Heat of which *they* place the Heat of this *vital* Flame.

I have added these *few* Difficultys that urge this *Opinion* to the many *solid* Objections Dr. *Needham* hath made against it, which *never* yet have been, nor *ever* can be answer'd; the *vital* Flame having been hitherto never more *conspicuous* than in *Fish*, or a *Frog*, which by their own Confession live *without* it. And if that so much admir'd Astronomer *Kepler*, had *obtain'd* his Wish to become a *Tom Thumb*, and enter'd the *Heart* thro the *Mouth*, in the *darkest* Night, I doubt he would hardly have brought up News at his Ascent, of the *Twinkling* of a *Star*, much less of the *shine* or influence of a *Sun*, or *Moon* in the Body. De Form. Fœtu.

Besides, if all *Mineral* Waters pass in such considerable quantitys thro the *Chambers* of the Heart, as will *afterwards* appear, when I come to treat of *that* matter: 'Tis much so *tender* a Flame can *secure* it self against so *potent* an Adversary, when we see a *glowing* Heat and more *rampant* Flame extinguish'd with warm Water, by daily experience, in *culinary* Affairs. To which I shall add the *plain* but significant *definition* of a Fever, us'd by the *old* Physicians, *That a Fever is the Conversion of the native Heat into a fiery*: So that the *fiery* Heat is preternatural, which is still *good* Doctrine. *Theophrastus* also in his Book of Fire, says, *That the Heat that is in Bodys animate hath a kind of Moderation, or Mixture of Softness and Tenuity, not as dry Fire, hard and torrid. Calorem in sanguine animalium nec* ignem *esse, nec ab igne Originem traxisse*, are the words of the great Dr. *Harvey*. To *strengthen* the Opinion of *this* man of *Renown*, if we go so far back as the times of *Homer*, who, as a learned *Chronologer* of our own makes appear from a marble Record, liv'd in the Reign of *Diognetus*, sometimes call'd *Diogenetus*, King or Judg of *Athens*, in the 676 Attick Year, 3807 of the *Julian* Period, after the destruction of *Troy* 302, and before the *Birth* of our Saviour near 1000 years, about the time of K. *Bladud*, King of the *Britons*, and Founder of the *Bath*;

C. 3.

De Gen. Animal. p. 153.

Sir J. Marsham in Chronol.

Bath; *in* Il. ε. *v.* 342, he ſays, What is immortal hath no Blood, ariſing from Food, which God needeth not: and the ſhorter *Greek* Scholiaſt, commonly call'd *Didymus*, gives this reaſon, *beeauſe Death in Mortals is the deſtruction of Heat*; where expreſſing it by τὸ θερμὸν, *Heat*, and not *Fire*, gives ſufficient intimation, that the *Blood* hath not its *vital* Heat from *that* Original.

I acknowledg the *Soul* or Life of Man is call'd the *Candle* of the Lord, is term'd *Light*; and Chriſt is ſaid to be that Light *that lighteth every Man that cometh into the World*, which to me is no ſlender *Argument* of his *Deity*. He is that LORD that made and bought us; the Worlds *greater* and *leſs*, were made by *Him*; and in *Him* as GOD, *we live and move and have our Being*: but how far that hath relation to a *real* Fire, or a *metaphorical* or ſpiritual Light, 'tis poſſible may be ſooner determin'd by more *able* Divines. And if I underſtand that place in St. *John* [with the Author *de lumine interno*] of the *general Benefit that came to Mankind by the Incarnation of Chriſt*; I think I do much better than *ſome* others do, that make this Place their *warrant* for a vent to all the wild Suggeſtions of a *private* Spirit, under the notion of the *moſt* Holy. For the words ἐρχόμενον εἰς τὸν κόσμον, may not have relation *there* to ἄνθρωπον, but to φῶς ἀληθινὸν;

Dr. Owen Exerc. 4. p. 113. §. 24. n. 3,4.

ἀληθινὸν; so that Christ our blessed *Saviour* was the *true Light*, *that* illuminated *the Darkness of Mankind*, *when he came into the World*, *by his Incarnation* *. But more of this *Flamma Vitalis* in the sequel, when I shall give some Remarks on that *exploded* Opinion again receiv'd in by the *Author*, to which this *digression* was only design'd to make a way, *That the Heat of hot Baths proceeds from an actual Fire under ground*; who might with *greater* Ingenuity have better submitted to, or *invented* a newer *Hypothesis*, than plaid over again an old *batter'd* Cur, that hath neither *Courage*, Tongue, nor Teeth.

And here, had I not regard to the *Quality* and Fame of an eminent Person, I cou'd further insist on the *Vanity* of affirming, not only *that hot Baths turn the Circulation outwardly into the Skin*, but that the Bath *evacuates the* Semen by a contrary motion, *into the Cavity of the Body*, when the *Serum* must be meant, as is evident to any *considerate* Reader that *observes* the Discourse.

But what is *much* more material, is, *That many use the Bath without advantage, and some go away much worse than they came.*

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* Filius Dei, æternus λόγος, φῶς æternum, in mundum veniens, per ἐνσάρκωσιν, vitam & immortalitatem in lucem produxit, perque Evangelium innotescere fecit, &c. *As the same Author*, pag. 45, & 51. n. 11. & p. 3.

And

And no wonder, ſince no *Advice* is taken in the management of the ſame; and ſome of *thoſe* that are *well* advis'd, and live never ſo *orderly*, may go away perhaps to preſent appearance, *worſe* than they came, and *mend* at home, as many *Inſtances* prove that have been *already* given in a *Regiſter*, long ſince *publiſh'd* on that account. The Virtue of *bathing* and *drinking* the Waters, if *diſcreetly* manag'd, continues in the Body a *conſiderable* time after the Bath is left, and ſtill advanceth towards a *Cure*, till *quite* ſubdu'd and *alter'd* by *common* Meats and Drinks, which is *ſeldom* done under *a Months* time after, and is *one* reaſon why the Water *once* poſſeſſed, ought not to be *ejected* by any *evacuative* Medicine, unleſs great neceſſity ſhall require, but let alone to *perform* what was begun at the *Bath*; tho the Body ought to be *well* purg'd, and by Phlebotomy, *Vomit* or otherwiſe, *very* well prepar'd, before the *uſe* of the ſame.

And as to the Great *Diana*: I do not Pag. 5.
believe our *Senſes* are ſufficient to demonſtrate any *ſingle* Mineral in a Water, much leſs if a *Complication* of *many* ſhall be there. And I know *this*, that tho our *Author* af- Pag. 41.
firms, *That the Croſs Bath Pump-water taſts evidently Vitriolick*; 'twill be as hard a matter to produce any *Vitriol* thence, or make good the exiſtence of it to any *other* ſenſe, as 'tis eaſy to ſhow *Common* Salt and

Niter

Niter to any one that shall demand it. The *Acidity* may be owing to the *Sulphur* and *Salts*, but how far *Vitriolic*, I cou'd wish the *Taste* or any *other* means cou'd demonstrate. I remember the great Philosopher Mr. *Boyle*, that Honorable and Excellent *Naturalist*, was of Opinion, in our frequent Discourse of such matters, that the *Acid* in the Bath-water was not a *Single* but *Complex* Acid, and that any thing *Vitrioline*, or perhaps *Aluminous*, with great Caution was to be asserted in *any* Waters in *ENGLAND*: Niter and common marine *Salt* were unquestionable; but *Vitriol*, unless that of *Mars*, so dubious, that he had rather see it prov'd by *others*, than assert it *himself*. The *Vitrioline* part, if any, being most *volatile*, goes off in great part, before the Waters are *Cold*; and if
Pag. 63. the *nicer* Palate of *our* Author did not *taste* the Water *till the Gas* was over, I fear that *Vitriol* could not have that *evident* Taste he pretends it had. But *some* Mens Senses are *better* exercis'd; and tho the Touch, Sight and *Taste* may give sufficient Evidence 'tis *Water*, yet what is *dissolv'd* in or *mix'd* with that Water, stands in need of *better* demonstration. Neither in truth, is the *Composition* of Salts and insipid Earths, which blunt that sense in *any* Water, the *proper* Object of our sense of *Taste* (tho that sense be chiefly conversant *in Gustabilibus*) against which,

which, *such* as will admit of *no* Appeal, greater difficultys seem to lie than against a *Microscope* rejected by the Author. Our Senses, and especially the *Tast*, are generally more competent and *better* Judges about *simple* matters than compounded, unless *One* be predominant; and that the Waters of the *Hot* Bath at *Bathe*, were by any accounted *Vitrioline præ dominio*, this is the *first* Step I have *ever* known to be made to *evince* it, to which an *Alkaly*, not an *Acid*, makes *so* fair a pretence. P. 38, 39.

The *fix'd* Salts remaining after *Calcination*, so far exceed the Parts lost by *Exhalation*, that no *comparison* can be made to *any* Advantage for the Assertors of *Vitriol*, or any *Acid*, to be the *major* Part.

I shall not disturb the Ashes of the *Dead*, but safely say thus much, not only without offence to them, but with the *good-liking* of many now alive, That if we had not had *better* helps than the *bare use of our Senses*, we had not had that *distinct* Knowledg of the *Mineral* Waters in our *own* Land we now enjoy, and owe in *good* measure to the *wise* Industry and great Charge of the Late truly Honorable and Immortal Mr. *ROBERT BOYLE*, whose Memory is *still* dear not only to my *self*, but to the *best* Philosophers, and *all* useful, *good*, and ingenious Persons; nor of those in *France*, justly attributable to the *indefatigable* Pains, and *exact* Scru- *Tryal of Mineral Waters in* England.

 tiny

Observations on the Mineral Waters of France.

tiny of that faithful *Chymist*, whom the *King* his Master so much valu'd and *encourag'd*, the Sieur *de Clos*.

Now whether the *convincing* ways of Tryal, taken by these two *Heroes* in natural Philosophy, bear *any* proportion to the *Bravado* of our Author, where he

Pag. 12. says, *Tho most Baths have compounded Salts, yet some* ONE *is most predominant, and by* THAT *I will distinguish the several sorts of Mineral Waters and Baths*; the Reader may be judg. I hope he doth not mean that the *predominant* Mineral discovers *all* the rest; and if the *Taste*, which is most agreeable to believe, discovers *only* the predominant, the *other* Minerals in the Composition, will scarce be discern'd by the rest of the Senses; and perhaps the sense of *Hearing*, which he always excludes as *useless*, may do more service than the rest, in *conveying* to the Understanding, the *Discoverys* and Sentiments of *better* Enquirers.

Pag. 9. Neither am I yet convinc'd, that the *Long* Bath in *Bathe*, is the *Hottest* Bath we have; Touch, I know, cannot discover it. For the Water of the Long Bath, being so far distant from that of the Kings, with which alone it stands in competition, that Tryal cannot be made of Both at Once. And that Person that shall pretend to remember the degree of Heat in the one, when he toucheth the other, had need

of

of a better Memory than I have (which yet I never had any reason to blame) to assert it; and whoever shall read a Treatise in Latin, printed not many years since, under the Title of *Thermæ Britannicæ* (for it doth not appear by any thing more than the name of the *Long Bath*, that the Author knows there was any such extant) will find at the latter end of the first Chapter, a Table exactly computed, according to a Thermometer, with Spirit of Wine, wherein the bottom of the King's Bath (the main Spring *all* in) to be return'd at *one* Foot, *eight* Inches, and *seven* Parts, on the *neck* of the Glass, in the *Summer* Season; when the *Long* or *Hot* Bath, commonly so call'd, amounted only to *one* Foot, *five* Inches, and *four* Parts, in the *same* Season; *three* Inches and as many Parts *difference* on the *King's* Bath side; which, I presume, cou'd not so *exactly* be discover'd by the *Touch* of the ingenious Author or *any* other.

Altho I am of *Opinion* that many *considerable* effects are produc'd by *Heat*, without *Accension* or *Flame*, yet that *some* Hot Waters do owe the *Origin* of their Heat to an *actual* Fire, where Eruptions are *visible*, I never deny'd; and the neighbouring Heat of *Vesuvius* and *Ætna*, continually burning Mountains, to the *Hot* Baths in *Italy* and *Sicily*, give, I grant, a *sufficient* demonstration of the *Cause* of the P. 7, 8.

the Heat of *those* Waters, and others of *like* Circumstance, from an *actual* Fire: but what he means by that which follows,

Pag. 8. *and by parity of reason we may guess that the same Cause gives the like Heat to Baths of colder Climates, tho the actual Fire be not so visible there,* I know not; and judg it as *weakly* asserted, as what I find in *another*

Pag. 12. place, *That there is the same Depression of the Earth into a deep Valley at* Buxton, *which appears at* Bathe; *and that contrivance,* he conceives, *was absolutely necessary to come nearer the Central Fire, for the boiling of the Water.* The *Author* mention'd before, in his *Thermæ Britannicæ, c.* 8. hath spent *much* time and *many* Arguments to evince the *Non-existence* of that *chimerical* Notion, of an actual Fire *kindled*, and continually burning in the *Bowels* of the Earth, without *Eruption*, and hath *there* consider'd this *Central* Fire, more especially in relation to an *Hypothesis* of the like nature of *Athanasius Kircher*, in his *Mundus Subterraneus*; where, contrary to what he would have to advance this Opinion, the *Center* of the Earth is represented according to the *old* Philosophy, dense, *pure* and elementary Earth, Cold and Dry, and so in *direct* opposition to *Fire* and Water; to which I shall here *add*, to make appear how *inconsiderable* the *parity of Reason* is, that the small distance from the *Top* of an Hill to the *Bottom* should be so *necessary* a

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Contrivance by the Wisdom of the Creator, to set the *Pot* so much *nearer* the Fire for a more *speedy* and effectual Heat; to set this, I say, in its *due* Light, I shall add, that the *Diameter* of the Earth is accounted by *Cluverius* and other Modern Geographers, to be *one* thousand, *seven* hundred and *eighteen* Miles, and *two* Elevenths; and by consequence the *Semidiameter* from the *Circumference* to the *Center*, eight *hundred*, fifty and *nine* Miles, and one *eleventh* Part. Now what Advantage or Disadvantage can this *Eleventh* Part of a *German* Mile; or if you please, allow a *whole* One, which being *four* of ours, will overmatch, I believe, the height of any Hill about *Bath* or *Buxton*: What, I say, can *this* bring to the Increase or Decrease of a *Fire* under Ground, that is above *eight* hundred and *fifty German* Miles at a distance from it; when the most moderate and modest *Philosophers* of this Opinion are content with *Thirty?* And yet this is made a *necessary Contrivance* of that Being that is *Wisdom* it self, and never intended *weak* men should pretend to *Philosophy*, being the Doctrine of the *Wise*. But we have been so *long* taught, that because Fire *heats*, therefore *wherever Heat is there must be Fire*, that we have very *few* that will *seek* for or respect any *other* Cause of the *Heat* of Hot Baths, than an *actual* Fire under Ground; in the asserting

Geogr. l. 1. c. 7.

of which, they have so many *Places*, *Pabulas*, Subterfuges and *Shifts*, that ever since I first read the Learned Dr. *Jorden*, I discharg'd the old *idle* Fancy of the *Antients*, and became an entire *Convert* to his Opinion.

'Tis here to be noted, that in the measures I have given of the *Semidiameter* of the Earth, I have follow'd the account of the modern Geographers; whereas *Alfergan-nus*, the Learned *Arabian* mention'd by the two Oracles of that Language, *Pocock* and *Golius*, and other *Cosmographers* among the Antients, as may be seen in * *James* and *John de Dondis* of the Baths of *Padoa*, allow the *Semidiameter* of the Earth's Sphere to be above *three* thousand Miles, and place the Cause of the Heat in less than a *hundredth* Part of that space from the *surface* of the Earth; which is much the same with *Cluverius*, who makes the Earth's *Diameter* to be about 6872 Miles, according to *our* account.

* Op. de Baln. p. 94, 109.

Besides, 'tis much that all *Rivers*, and more especially the *Sea* it self, the *Bottom* of which lies much *deeper* than *Bath* or *Buxton*, and therefore fitter to receive the Heat of a *subterranean* Fire, under so great a *Caldron*, do not grow *Hot*, and the Sea *much* Hotter than sometimes it is; which probably may arise from a *Fermentation*, occasion'd by the *violent* Commotion, and *strong* agitation of the great *Va-*

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riety of Particles contain'd in the same; when a few *cold* Springs, cover'd over, choak'd, and buried in Dirt, *Glare* and Earth, till they can make their way to their *Heat*, not far from the *Surface* of the Ground, and so much more *remote* from a *Central* Fire, shall be so *highly* favour'd as to participate so *largely* of the *Bounty* of a *subterranean Fire*, at so *great* a distance. I call the Springs *Cold*, because I am of Opinion, that *all* the Water of *Hot* Baths is at *first* Rise originally *Cold*, as appears, when taken from the Springs, in *returning* to the first *Principle* to be cold again; there being no *Tangible* Body, Solid or Liquid, according to my Lord Viscount *St. Albans in Augmento Scientiarum*, that is *Hot* in its *own* Nature, but receives *Heat* from *another*.

Again, the *Equality* and Evenness of the Heat of *Hot* Baths, must have a more *steady* Cause than a *Fire* can be; for *that* as it meets with *Pabulum more* or less to maintain it, must be *stronger* or weaker, greater or *less*, as the *Bitumen* and *Sulphur* succeeds to *foment* it; not to mention the *vast* Quantitys must be spent without *Renovation*, which the *continual* Depredations of a *devouring* Fire will not *permit*, since Hot *Baths* generally continue still in the *same* place where they began, without any Alteration *perceptible* in Situation or Heat. Neither can the *nicer* Notion of

the *finer* Peripateticks any way affect the *Reason* I have, who ridiculously assert both a Fire and a *Flame*; the Heat of the *Fire*, thro the sides of the *Channels*, to melt the *Sulphur* and *Bitumen* into the Nature of an *Oil*, and the *Pabulum* so melted to follow the *Flame*, as in a *Candle* or *Lamp*. To make it *further* appear in what Credit a *subterranean* Fire stood among some eminent Physicians in *former* times, as to the *Cause* of Hot Baths, I shall refer the *Reader* and the *Author* too, to the convincing Testimony of a very competent *Judg* in matters of that kind, being a great *Physician*, a Nobleman by *Birth*, and writing of the *Baths*, where it seems he was born. 'Tis *Joannes de Dondis, Nobilis Patavinus, de Fontibus Patavinis, cap.* 3. *Op. de Baln. p.* 97. *b. Is asseruit versus superficiem in parte terræ corticali, calorem igneum, sine flamma, aut igne accenso, esse causam caloris aquarum Thermalium.* His words are these.

Si alicubi in terræ profundo Mineræ Sulphuris accendantur & inflammentur, videtur necessarium esse, in directo ipsarum, aut in proximo, de Terra Fumos Sulphureos atque IGNES erumpere; propterea quod neque in Sulphure, neque in alia aliqua quantacunq; inflammabili materia, potest inflammatio aut accensio procedere & durare, nisi expurgentur & exhalent Fumi, qui necessario fiunt & multiplicantur, ex qualibet inflammata

materia, & plus ex Sulphure quam ex aliis. Et ideo in loco constructo & clauso, non habente viam, nec Foramina seu poros, unde possit esse Spiraculum & exitus Fumorum, confestim deficit accensio seu inflammatio, in quacunque fuerit materia, quod expertus testificor, & in Sulphure accenso, & in Candelis, Funali & Carbonibus, &c. Et paulo post: *Necessarium est si in Terræ Profundo alicubi incensa sit Minera, aut ex illis locis exhalare IGNES, aut incensionem Mineræ deficere in brevi, si non habeat Viam aut Spiraculum; aut sibi violenter viam facere, aperta Terra, prout alicubi in Terræ motibus factum est.* Item cap. 7. *de Fustis ad Carbonum Similitudinem in Thermis observatis. Puto quod non possunt in illis profundis* ardere, *& flammam emittere, propter conclusionem loci & privationem expirationis.* Where *Smoak, Fire* and *Flame* have respect to the *accended* Minerals under Ground, and not to a milder *Steam* from the *Surface* of the Water, as at the *Bath*. This is rendered *more* remarkable, that the Learned *Joseph Scaliger* commenting on that place of *Tibullus*, l. 4. where *ardens unda* is mention'd, ridicules this Opinion in these words: *Pretty ingenious subtle men! who can no sooner see Hot Water or a Bath, but presently conclude that the Heat is from Fire.* But this is a place not to treat but to remark.

That *the Waters of* Buxton *do contain more Salt than the Bathwaters at the* Bath; Pag. 21.

when Dr. *Liſter* found not *forty* Grains of Salt in *two* Gallons of *that* Water; and another Obſervator *de Therm. Bathon. Obſ.* LXVII. found *two* Scruples, or *forty* Grains in *half* that quantity of Water at the *Bath*; 'twill oblige the Author to prove *thoſe* Experiments *defective*, rather than to *diminiſh* the Obſervations of ſuch *diligent* Enquirers.

P. 31. That *Copper Waters are the Atramentoſæ of the Antients*, I *ſcarce* believe, but think them rather to be *Copperas* Waters; Copperas, not *Copper*, being the chief *Ingredient* in Ink, the foundation of which is *Vitriol*, or Copperas, call'd *Calcanthum* by the old Authors from the name of *Copper*, or the more *comprehenſive* one of *Braſs*, tho χαλκανθος, & χαλκος ἀνθος are not the *ſame*, as *Gabriel Fallopius*, in his Tract *de Foſſilibus*, makes fully appear. And whereas he ſays in the *ſame* place, that *Calcitis is the Stone and Calcanthum the Ruſt*, he might have had better information from the ſame *Fallopius*, who accounts *Sori*, *Miſy*, *Calcitis* and *Melanteria*, the four Species or *Sorts* of *Calcanthum*, *De Therm. Aq. & Metal. c. 7. p. 243.*

C. 16. de Flor. æris, in princ.

P. 31. l. 15.

But to let paſs *many* things of *leſſer* moment, the *next* I ſhall conſider as *more* material, is the *Nitrum Calcarium*, on which this *Naturaliſt* ſays, *the roughneſs of the Waters at the Bath doth depend*. A notion I confeſs *newly* advanc'd, but on as *ſlender*

P. 41.

grounds

grounds as may be. A natural Mineral *Niter* had a long time serv'd the turn well enough, and it may be much better than *Niter* with a hard word at the *End*. I call it a *hard* word, because hard to be *understood*. For it must either have respect to *Niter* so call'd, which commonly in *moist* Places adheres to *whited* Walls, from *Lime* in the *Mortar* or *Whiting*, or relation to *Burning*. Calx, unless he means *Chalk*, is not *so* till after *Calcination*; both suppose *Fire*, one in the *Kiln*, the other in the *Bowels* of the Earth. The first cannot pretend to the *Nitrum Calcarium* in the Waters of the *Bath*; and as to the *latter*, the Reader's Judgment is inform'd already. And if a subterranean *Fire* will not help, as hath been shewn before, a hard sort of Stone call'd *Lias*, commonly us'd in the making of *Lime*, and the *proper* Limestone of these Parts, will *never* do. For I do affirm upon good Grounds and *repeated* Experiments, *that* sort of Stone hath nothing to do with the *Bath-water* at all. I insist on *this* the more, because tho *Lime* may be made of *many* other Stones, and some much *harder* than *Lias*; yet *this* Stone is most in use with the *Lime-burners* about *Bath*, as *better* qualify'd than others are for the making of *Lime*. Now if the *Author* can produce any quantity of *this* Stone, or any thing relating to Lime, out of the *Bath-water*, which must lick from

ſoft Quarrys, where a very *ſenſible* Heat hath been felt by the *Diggers* in the Winter Seaſon, *Erit mihi magnus Apollo.* And if there be neither *matter* for Lime, nor any *Fire* to work upon it, how can any Man in his *Wits* aſſert a *Nitrum Calcarium*, unleſs he will fetch his *Nitrum Calcarium* from the natural Mineral calcin'd by *Fire* in the Bowels of the Earth? which, as I have *already* prov'd, is both *groundleſs* and *abſurd*.

But *ſome* Philoſophers and *Phyſicians* too, are much like a *certain* Magiſtrate at the beginning of the *Reformation*, who having an *Offender* brought before him, reprov'd the *Criminal* with, *Sirrah! You do Quivo, Quivo, Quivo*, and being quite out of breath in purſuit of the *Word*, ſaid to his *Man* that ſtood by, *What's the new Word* Toby? who *gravely* reply'd, *Equivocate* Sir. Not that I *contemn* any *new* Diſcovery, if it do not *obſcure* a more *antient* Truth. If *Freeſtone*, an eaſy tender working ſtone, much like what ſome call *Lime-chalk*, but is not the *ſame*, nor fit to make *Lime*, be enquir'd for about the *Bath*, there are Workmen *enough* to tell 'em *where* they may find it; which is all the *Nitrum Calcarium*, or *Lapis Calcarius* I know in the Water of the *Bath*, and bears *greateſt* proportion among the *Non-ſaline* Principles, and is what the *Author* calls *Lapis Calcarius*; when in the *ſame* place

place he ſays, *the Lapis Calcarius is double in proportion to the Salts*; but extravagantly adds, *the other evaporates by boiling.* As if *nothing* remain'd after *Evaporation*, but what he calls *Lapis Calcarius*; when Common *Salt*, and Niter *natural* after *Decoction*, and the Contents ſeparated, paſs thro the *Filter* into a *Lixivium*; and after a *ſecond* Evaporation, make *one* Maſs or Body of *Salt* till further ſeparation; and both in conjunction with *Sulphur*, conſtitute a Salt *Salino-ſulphureous*, the main Ingredient in the *Chyme* of the Waters, plainly demonſtrable after *every* Evaporation. Not but that the gritty part hath its *proper* uſe, is the *greateſt* Dulcifier, and in *ſome meaſure* participating of the nature of *Chalk*, the ſtrongeſt *Oppoſer*, and beyond any *Alkaly*, a Softner, Allayer and Subduer of *Acidity*, among all the *Ingredients* contain'd in the Waters: and the *Roughneſs* in the Bathwater is rather owing to the *Oker*, than to any *Nitrum Calcarium* ſuppos'd in the ſame. Beſides, I have a Paper Manuſcript, containing ſeveral *Experiments* about Meats and Drinks, diſcover'd to me by an ingenious Perſon and great *Traveller*, that obſerv'd the *nature* of all Eſculents and Potulents whither ever he went, and *affirms ſanctè*, that 'twas the unanimous Conſent of all the natural Philoſophers he converſed withal, *That no Limeſtone Fountains were wholeſom.*

The

P. 81. The *Bullulæ* in the *Blood* are much a *second Nitrum Calcarium* in the Waters, but much more *refin'd*; and how *Hot* Baths Lin. 4, 5, can *agitate*, *rarify*, and by *Compression* 6, 12, 13. compel or *propel thro the Glands of the Skin those aerial Bullulæ*, I cannot imagine; but wish this *great* Philosopher wou'd explain, how *Heat* that *rarifies*, doth *propel* C. 2. p. 40. by *Compression*, and teach us, how we may l. 5. understand the Blood's *Compression by the Pulse*, which is the greatest *Thruster* forward by *Pulsion* in the Body. Compression in its *common* Notion, I never heard before was any *great* Friend to Motion; and P. 12. therefore *our* Author in his excellent Preface, allows *Compression to check the Humours in their Motion*. Compression may make a thing that is *rare* take up, or lie in *lesser* space, and so may better suit with the *Condensation* of the Antients: but that *Hot* Baths should *reconcile* Rarefaction and Condensation by doing both, is the P. 81. l. 4. *greatest* Virtue I have ever *known* to have been expected from 'em.

To omit many *other* Inconsistencies with himself, I shall only make this Remark on the *Bullulæ* mention'd in the former Paragraph (by others term'd *Globuli*, and peculiar to the Blood) That they must be very *tender*, and cannot retain *that* name any longer than mix'd with the *Blood*. For if they become so *rampant*, as by their *Elastic* force to leap thro the *Repagulum*

of

of a *double* coated Artery into the Skin and Air, they cannot preſerve the name of a *Bubble*, but muſt take ſome *other* Denomination. And probably theſe *Bululæ* in the Skin, or, as our *nicer* Author words it, *in the Glands* thereof, after all their *huffing*, may at laſt *dwindle* into Perſpiration or a *ſenſible* Sweat; and I pray, what *harm* is there in a *Hot* Bath, that inclines any one that uſeth it to a *gentle* Breathing? *Cold*, as our *ſage* Author *elſewhere* more rationally diſcourſeth, would rather *compreſs*; and therefore *Compreſſion* is more juſtly chargeable on the *Colder* Baths than on the *Hot*. Thus we ſee when *New* Philoſophers forſake *antient* Notions, without *due* Conſideration or *Reaſon* ſufficient, what *Abſurdities* many times they commit, and how *awkwardly* they propoſe their Minds to be underſtood by *any* but *themſelves*; unleſs they will have theſe *Globuli* in the Blood to further Motion, and ſo the *Circulation* to run upon *Wheels*. Pref. p. 12.

Whether Hot Baths *thicken* the Humors, eſpecially the *Serum*, or rather *Succus nutritius*, in or *out* of the Blood, and ſo diſpoſe to *Viſcidity*, and conſequently to a *Rheumatiſm* and *Arthritic* Pains, is a matter *highly* deſerves our Conſideration. I confeſs the ſame *Heat* that melts the *Wax*, hardens the *Clay*; raiſeth *Stinks*, and ſends forth *Odours*. The *Bath*, like the *Sun*, works according to the *Capability* of P. 47, 48, 82, *&c.*

the

the Subject, *relieves* the weary, *strengthens* the weak, and *discusseth* when it meets with *discussable* matter. And that I may *farther* illustrate the preceding Paragraph, about *Rarefaction* and *Condensation* by the *same* Cause, we shall now examine, whether the Heat of *Hot* Baths do *thicken*, condensate, or make more *viscid* any Humour in the Body, since 'tis sufficiently known that they do *discuss*.

To set this in a *clearer* Light than hitherto hath been done, I am *much* of Opinion that the Serum of the *Blood*, as 'tis commonly call'd, or the *Liquor* that surrounds and swims on *top* of the Blood, when drawn from the Body, is not the matter of *Urine*, but the *Succus Nutritius*, or *Nutritive* Juice; which after *mixture* with the Blood, and *Secretion* in the Brain, is passed into the *Nerves*, as the Extract and *Quintessence* of all our Aliment; the more active, pure, and *spirituous* part of which enters the *Nerves*, in order to *Sense* and *Motion*, besides *Nutrition*; the crass, *gluey* and more viscid, not passing the *Strainer*, is ejected in due time, as *Excrement* of the Brain, *white* and *viscid*, chiefly after Night *Sleep*, in the *Morning*; much after the *same* manner as the *grosser* Excrements arise by Secretion from the *Chyme*, or confus'd Mass of all together in the *Guts*. And as the *Venæ Lacteæ*, and what they contain, are not *Visible* when

the

the Chyle is *pass'd*, nor the *Lymphaticks* or *Lympha*, when *empty*; so this Liquor or *Succus Nervosus* is not discoverable by *Ligature* or otherwise, but in the time of *distribution*, which 'tis probable is in good part made in the *Night*. Hence the *Language* of the *Dormouse* in the Poet, *Pinguior illo tempore sum, quo me nil nisi somnus alit*: 'Tis generally observ'd that the least active and *sleepy* Creatures are commonly *Fat*. And this may be one reason, till a *better* be given, why the Liquor or *Succus* in the *Nerves*, is not so demonstrable by Ligature on *them*, as the *Circulation* of the Blood is on the *Veins* and *Arterys*.

Mart. l. 13. Ep. 56. in Xeniis.

This *serous* Succus, or *liquid* juice of the Blood, when extravas'd, will *coagulate* by Heat, as I have often try'd, and *many* others, no doubt, have done the like, in a *Silver* Spoon with the Succus held over the *Flame* of a Candle, or set upon Coals of *Fire*, in any other convenient Receiver. But whether the *Heat* of the *Bath* be answerable to *that* degree of Heat, and *whether* the Succus that is mix'd with many *other* Humours in the Blood, clothed and defended with *Skin* and *Flesh*, can pretend to such an advantage of *Coagulation*, as that hath which is *out* of the Body, *single* and without *any* impediment, deserves *further* Consideration.

Moreover I do observe, that the *sizy* Blood, commonly seen upon the *Cold*

Blood

Blood after opening of a Vein, in all *Rheumatic* and *Gouty* Persons, chiefly the *Former*, to which some eminent Physicians make it a *Peculiar*, is not coagulated till the Blood is *Cold*, but is *mix'd* with the Blood, with which it *circulates*; even in those *very* Persons that have us'd the *Bath*, and have been *often* bled for that Distemper on the *Place*: so that *Cold* seems more likely to *coagulate* this viscid matter than *Heat*, which as long as *Heat* continues in the Body, retains *Fluidity*; but as the Blood grows *Cold*, congeals into a white cakey *Skin* adhering to the *Blood*.

And here it may not be *improper*, if I mention a Case, being the 142*d* Observation of that *eminent* Practitioner *Carolus Piso*, sometime Counsellor and *Domestic* Physician to *Henry* the Second Duke of *Lorain*, to whose generous Soul many *grand* Improvements in Physick are deservedly due, and from *whom* the great Physician and *Ornament* of his Faculty in this Nation, *Dr. Willis.* *borrow'd* among others, his Notions in the comparison of *Blood* and *Wine*. This Famous Person, I say, hath *this* Observation, in his excellent Book, *De Morb. a Diluvie Serosa.* S. 5. *c.* 3. *pag.* 529. *Ed. Lugd. B.* "I am well acquainted with "a Prelate of singular Prudence, who, in "the Winter-Season, is often troubled "with Pains in the Habit of the Body, "and continually with a Catarrh. This

"Per-

" Perſon's Blood did ſo abound with a ſe-
" rous Colluvies, that ſcarce the twen-
" tieth part did ſubſide in the bottom,
" that retain'd the Colour and Conſiſtence
" of Blood; the remainder, which was
" Liquor of a watery ſubſtance ſwimming
" at top, was laid over, and as it were
" incruſted with a viſcid white Skin: and
" ſuch ſort of Blood, if it may deſerve
" that name, I have only once or twice
" obſerv'd in others.

This Diſeaſe he doth not call a *Rheumatiſm*, becauſe rare, if *known*, above a *hundred* years ago, the firſt Edition being printed by the Author 1618, in large Paper in *Quarto*, which I have given with *other* Books to the *Library* at the *Bath*: tho *Riverius* hath Deſcriptions *like* it from *elder* Authors, even in the times of *Hippocrates*, *Galen*, and *Ebus* (commonly *Avicenna*) tho not by the name of *Rheumatiſm*. In Prax. med. de Rheumat.

I mention this the rather, becauſe *Piſo* ſays, he obſerv'd the *fizy* Skin to cover the *Serum* only, which on *due* Examination he had found *adhering* to the Blood.

This Dr. *Harvey* in his Exercitations *de Animalibus*, calls *Mucago*, found it on top in the place of the *florid* Blood, and on *that* account, by miſtake, judg'd it the *beſt*, moſt concocted and elaborated Blood, not apprehending a *Diſeaſe*, nor that the *Mucago* or Jelly muſt be *ſupreme*, the con-

concreted fibrous Blood being *cover'd* over with the *vitiated* Juice, between which and the *Mucago* there is very *little* difference, as will appear hereafter.

That this is a *Corruption* that lies in the *Maſs* of Blood, *Riverius* is plain: *Sanguis qui detrahitur plane corruptus eſt, craſſus, & glutinoſus, tum poſt multas phlebotomias, ſero diffluit, ita tamen mutatus, ut ſanguinis ſpeciem amiſerit.* In the *Gout* he mentions *no* ſuch thing, from which he makes *this* a diſtinction, tho ſometimes there may be a *Complication* of both; and a *running* Gout may be a *Rheumatiſm*, as well as a *fixt* Rheumatiſm a *Gout*. And ſince in Monſieur *Nicholas Andry* a *French* Phyſician, Meſſire *Fagon*, chief Phyſician to that King, hath laid ſuch a *Load* of Diſeaſes on the back of *Tobacco* we are not ſenſible of; with greater *Juſtice* we may return the *Rheumatiſm* to *France*, which was never known ſo *frequent* in theſe Parts, before the immoderate uſe of the *Wines* of that Country; and think this much *better* Doctrine than the *Diviſibility of Quantity in infinitum*; or that *more than Fifty Thouſand Worms have been SEEN in a portion of matter, not ſo large as a Grain of Sand*: which is much to the reputation of that *Glaſs*, that can ſo prodigiouſly magnify, as to repreſent above a *Hundred Thouſand* Parts in *one* Grain diſtinct, ſo as to be perceiv'd by the Eye, *which I ſhould rejoice*

Ubi ſupra.

to

to ſee: or that *the Melt of a Codfiſh contains more Worms than they are.*

Again, I have good reaſon to believe, that the *ſizy* matter mention'd before, is not a Corruption only of the Nutritive Juice in *part*, according to my Obſervation; but, as *Riverius* hath obſerv'd, a *total* Depravation of the *beſt* Blood alſo, known by the name of *Sanguis purus*, or *Arterioſus*, in contradiſtinction to the *Melancholicus* or *Venoſus*, which is always *blacker* and at the *bottom* of the Diſh, and becomes *brighter* if expos'd to the Air; when the *purus Sanguis* and *beſt* Blood, is uſually florid on the Top. For the *whole* Maſs of Blood, being compounded of *four* general Parts, which the antient *Galeniſts* call'd *Humours*; two are contain'd in the *watery* part, anſwering to the *Serum* in Milk, and two in the *caky* or cheeſy Part, correſponding with the *Curd*. The *two* firſt the *Antients* nam'd *Bilis* and *Pituita*, underſtanding the *firſt* aright, but miſtaking the *ſecond*, which ſeems to be in good part the *Succus Nutritius*, or Nutritive *Juice*; the *Antient* Phyſicians, and many *Moderns* too, calling *all* the Humors that were *white* and *ſweet*, by which they made a diſtinction from *Pus* that was fœtid, by the name of *Pituita* or *Pituitoſe*, as that which was *thinner* and more crude, *Ichorous*; and all by the general name of *Serum*, or a *Serous Colluvies*, not mattering much what

the *Nature* and Constituents of those *Humors* were, but *chiefly* minding their *Presence*, *Flux*, and Tendency to the *Cause* of a Disease. The *two* other sorts of Blood in the *Cake*, they call'd *pure* Blood and *Melancholick*. The *first*, suppos'd to be the Blood of the *Arteries*, continues *red*, with a scarlet Rim or Fimbria in all *sound* Persons, distinct from the *blacker* part, which is always *underneath*, and thought to come out of the *Veins*. Now in all *Rheumatic* Distempers or Diseases depending thereupon, the Blood *extravas'd*, is sometimes more *dry*, sometimes more *serous*, and both laid over with a viscid *white* Skin, in the same place where the *best* Blood usually is in *sounder* Persons, and argues a *Corruption* of the *best*, which is the *worst* of all. The *watery* part continues round the Cake (now *white* and *black*, instead of *blackish* and *red*) and contains the *Bile*, and good part of the Juice that is *nutritive*; but whether any *material* part of *Urine*, in most *ordinary* Cases, which *possibly* may pass to the Kidneys *another* way, I am *yet* uncertain; betwixt *which* and the *Succus* in the Blood I observe this manifest distinction, *That no degree of Heat will coagulate Urine.* So that with some Caution I receiv'd what an Inceptor maintain'd at a publick Act in *Oxford*, 1693 [*Quod Urina sit sanguinis progenies*] *That Urine is the Product or Issue of the Blood.*

Blood. That the *nutritive* Juice and the *best* part of the *Blood* are *vitiated* in a *Rheumatism*, seems to be most *evident* from this, That an *Elephantiasis*, *Leprosy*, or any *foul* Skin is *cur'd* by the constant *use* of the *same* Medicines that are us'd in a *Rheumatism*; in the management and *use* of which I have had such *good* Success, as would tempt a Man in the same *Circumstances* with Dr. *Fuller* to *reveal* the *Particulars*. A signal Instance of which I had in my self subject to a Rheumatism and Pains of the Gout, which sometimes for a while returns, but by *often* bleeding then in *great* Quantitys, near a hundred Ounces in less than *two* Months, and in the mean time and *afterwards* running my *own* Course of Medicines, I so alter'd the *whole* Mass of Blood, as to free it from *Size*, and make the *upper* Rim as fresh and *florid*, as in the best of my Health; as I found, when Mr. *Child* open'd a Vein for Tryal *Jan.* 21. 1702. and again the 18 of *May* following, in a Pound of Blood at each Venæsection.

And *here* I must *again* differ from the Famous Dr. *Harvey*, who will have the *depraved* Part not in the *Live* Blood, but in the *Dead* and Corrupted; since 'tis not to be doubted, but that the *good* and *bad* Blood were both in the *Arterys* and *Veins* in common Circulation, in a state of *Union*, till they come to a *Separation*; which

the *Heat* of the Blood and *Body* hinder'd within, till out of the Vessels, and the *Solutio Continui* follow'd, on its *dying* extravas'd. Thus both the *Bathwater* and common *Urine* hold the Contents together, when *Hot*; and do not deposite any Sediment, till *precipitated* by Cold.

'Tis *further* to be noted, that the *Cake* of the Blood *sinking*, the vitiated Juice, which Dr. *Harvey* thought the *best* Blood, must needs be at the *Top*; the juicy Liquor the Cake *swims* in at *first*, being of the *same* nature with the *Mucago* it self; which name it *best* deserves when Cold, and in the nature of a *Jelly* settles on the Surface of the Blood, which when *separated* from the Blood becomes a *Skin*, one of which I have *now* by me like a *Bladder*, and transparent as *Horn*.

And whereas I plac'd *this* as a distinction of the Succus Nutritius, that increases *bulk*, and supplys the necessary *Expences* of Nature from *Urine*, that the latter will *not* coagulate as the *former* doth, by the application of *Heat*; it doth not thence *unavoidably* follow, that the matter of Urine was *never* mix'd with the *Blood*, which must in some quantity be sent from the *emulgent* Artery into the *Vein*, as well as pass in *part* by Ways hereafter mentioned to the *Heart*, and so *circulate* with the Blood: but the reason why the *Succus* doth coagulate, is much because the matter of

of *Urine* is not there, the opening of a *Vein* being commonly perform'd in a *Morning*, when the *truer* Serum or *matter* of Urine had been *separated* before: Whereas the *Water* on the Blood taken *two* or *three* Hours after Meals, is sometimes *white*, from a mixture of *crude* Chyle; and always, to the best of my Observation, in the *Afternoon*, of a nature much *differing* from that in the Morning. But that the *Succus* and *Urine* are distinct, is not to be doubted. And if it be true what is *generally* taught by the most able *Physicians*, that *Sweat* and *Urine* have the *same* common Cause, or matter *little* different; whereupon those that sweat *most* make *least* Water, and are *jestingly* said, to *piss thro the Skin*: 'tis pretty *hard* to conceive, unless our *acute* Author please to favor us with *better* Understandings, how the *Succus* can be evacuated by Sweating in the *Bath*. If so, I'm sure it must go hard with what he asserts in another place, *That the Hot Baths at* Bathe *do wonderfully thicken the Serum*; since the *Serum* he means is the *Succus* or Nutritive Juice, which he affirms to be *spent* and *evacuated* by the Heat of the *Bath*, the matter of *Urine* and *Sweat* having another *Original*: so that *here* the Bath must *condensate* and *rarify* the *same* Juice. He was of opinion *before*, that the *hot Baths at* Bathe *were mischievous*, in *evacuating the Serum into the Cavity of the*

P. 42, 49.

P. 47, 82.

P. 31.

Body (for so I favourably read for *Semen*) and how *thickening* the Serum and *Evacuation* of it can consist, I would feign be inform'd, *Condensation* as *Compression* looking one way *only*, by which Motion *cannot* be accelerated and impeded *together*.

To give a little light into what is elsewhere more *fully* consider'd, being the result of many Thoughts about the *Passages* of Urine:

'Tis very probable, that tho the Meats and Drinks we take at *Meals*, make one confus'd mix'd Juice in the Stomach, call'd *Chyme*, the Parts thereof, in some measure, continue separate and *distinct* each from other; and that the *Liquids*, especially if taken *plentifully*, pass out of the Stomach before the *Solids*, as having paid their first Fruits to the *Lacteæ* of the Stomach (observ'd contrary to the Assertion of *Asellius* the Discoverer, by Dr. *Wharton*, and by him first shewn to Dr. *Glisson*) descend into the Guts, enter the *Venæ Lacteæ* of the *Mesentery*, much sooner than the *other* part that is left behind, make their way to the *Receptacle* of Chyle in *Brutes* (a Cavity that receives as well the *Serum* as the *Chyle*) and the more solid *lumbar* Glands in *Man*, and thence goes directly to the emulgent *Artery* (by some Branches of the *Venæ Lacteæ* which have been observ'd to reach *thither*) without any *mixture* with the Blood at all,

De Ventr. Tr. post. c. 3. p. 134.

'Tis

'Tis no *less* probable that the *remaining* part of the *confus'd* Juice in the Stomach, after some stay there (out of which part may pass *immediately* by the *Stomach*-Lacteæ mention'd before) descends into the Guts, passeth into the *Milky* Veins of the *Mesentery*, and halts in the *Receptacle* and lumbar Glands, in order to Separation; the *main* use of these Glands being *Serum a Chylo separatum in adjacentes vel* Renes *exprimere, vel emulgentes* Arterias, *quibus ramos mittunt*; which cannot be deny'd, if *these* Glands are not allow'd to be a *Receptacle*.

'Tis *further* probable, that this *last* confus'd Mass of Juice contains *three* Parts; *one* that is to be red, for the matter of Blood; *another* part of the same *Chyme*, not so apt to be red, or at least not so yet for *Nutrition*; and a *third* part more thin and serous, for the matter of *Urine*, utterly uncapable of the Purple dye.

That the *two* former pass from the *Lumbar* Glands, by the left *Axillary* and *Subclavian* Branch, into the *Vena Cava*, and so into the *Heart*, mix with the *Blood*, and continue together, till the *nutritive* Juice is secreted in the *Capital* Gland the Brain (to which, with *Hippocrates*, I allow that name; because tho medullary and *sui generis*, differing from the rest, it performs the Office of a *Gland*, which is *Separation*) not sent up to the *Head*, imbib'd

bib'd by the Nerves of the *sixth* pair, in the *Plexus* of the Meſentery, as was the Opinion of Dr. *Gliſſon* and his Followers heretofore, the Learned Dr. *Charleton* and others.

And whereas the only *material* Objection Dr. *Gliſſon* hath made againſt the Brain, as the *Organ* firſt admits the matter of Nutrition, is the *Smallneſs* of the Arteries that tend that way; whoever ſhall conſider the *Capacity* and *Structure* of the internal and external *Carotids*, as they are exhibited by the celebrated Dr. *Highmore*, in the 18*th* Table of his *Diſquiſitio Anatomica*, and which the ever memorable Dr. *Willis* in his Treatiſe of the Brain affirms to contain, not only a *Torrent* or Stream, but a *River* of Blood, may *poſſibly* be of opinion, that *that* Artery alone, not to mention the *Vertebrals*, is not ſo *Perexile*, as not to be able to convey a *greater* quantity of *nutritive* Juice from the *Heart* to the *Head*, to be ſecreted in the *Brain*, and it may be more than *all* the Nerves in the *Plexus* of the Meſentery are capable of. And I would beg Dr. *Willis*'s Pardon, if it could be had, that I do not admit *his* Hypotheſis of the motion of the Succus Nutritius, *forward* and backward, *upward* and downward, by a *contrary* way of paſſing in the *ſame* Nerves, ſince I find no abſolute *neceſſity* to aſſert, that the *nutritive* Juice contain'd in the *Arteries*, doth

paſs

pass any further, *except* in the Brain, than their *Extremitys* will carry it; and the *sudden* Refection from *Cordials* and *spirituous* Liquors, may be *better* perform'd by the *Venæ Lacteæ* than the *Nerves*. But that the *nutritive* Juice, according to the *Doctrine* in this Paragraph, doth pass by the Thoracic Milky Veins to the *Heart*, is evident from an Observation I formerly made in *Oxford*, in the Body of one *Hall*, a hard Student of *Wadham*-College, presently after Meal; who after frequent *great* Lipothymies, and many Remedies, at last died; and in the right Ventricle of the Heart, I found a *Gelly*, under the rude Shape of a *Serpent*, occasion'd by the spreading of it into the *Auricle*, Vena Cava and Lungs, in some measure concreted in the *Heart*, as the *Succus Nutritius* useth to do over a gentle *Heat*. The like Concretion the ever famous Dr. *Willis* observ'd in *both* Ventricles of the *Heart* of a noble Person, *de Morb. Convulf. c.* 9. where he writes it did *serpentis cum cauda multiplici, & divisa figuram nonnihil referre*; which probably may be a sort of *Polypus*, observ'd also by *Malpighius*, *Tulpius*, *Bartholinus*, and others, as in my medical Observations not yet made publick (where you have the Figure) I have *further* declar'd. Whether the *Serpent* sometime since found by Dr. *May* in the Heart of one *Penant* that dy'd in *London*, was the *same*,

I cannot say, being so long since I have seen his account in Print, which I have not by me. Now only Dr. *Andry* mentions Worms in many Bodies that resemble
Pag. 81. *Serpents*; and writes that *Heart-Worms*, which he calls *Cardiaci*, occasion Tremblings, Swoonings, and *in time* bring sud-
Pag. 86. den Death. Another Case he mentions
P. 132. not unlike *Hall*'s: The Patient had been too intent upon Study *Night and Day*, and having no *Polypus*, recover'd of a lingering Sickness, by a Medicine that caus'd him to void great quantities of *Worms* by Stool. He further adds, *that too much Application of Mind, and over great Efforts of Study cause Corruption in the Body, more especially when Men set themselves to long and serious reading presently after Meals.* But to come nearer the point in hand: In an *Exercitation* I formerly made upon *Nutrition*, I have shewn at large the *difference* between Life, Sense and Motion, and what *maintains* these Actions in *Man* and *Brutes* distinct from one another, which I close with these Words: *Imperium Nervorum Animale a regno vitali sanguinis plurimum distinguitur. Rubente succo incalescimus, albescente nutrimur. Nervi, Venæ & Arteriæ, vasa invicem distincta, diversum ferunt ac referunt materiam; sub succo hoc nutritio, verum Rorem, Glutin, & Cambium intelligo; qui succum nutritium, luce meridiana nobis clariorem, sub istis umbris,*

per

per transennam viderunt. Adeo ut sanguis non nutriat, sed nutritionis solum in se, donec ope Cerebri Nervos ingreditur, contineat materiam. Adest tempus, & venturum olim prædixit Philosophus, quo ista quæ latebant diu, in lucem extraxit dies, & longioris ævi diligentia, &c. And now to come to the *last* Thought about the Passages of Urine: Seneca.

'Tis not improbable that the *third* part of the Chyle or *Chyme*, intended for Urine, leaves in Man the other *two*, when arriv'd at the *Lumbar Glands*, in which it is secreted, and *immediately* passeth into the emulgent *Artery*, by some Branches of the *Milky* Veins deriv'd from the *Lumbars*; it being the Opinion of *Pecquet*, the first Discoverer of the *Receptacle* of Chyle and *Thoracic* Ducts in Brutes (whose *Experiments* 'tis to be wish'd had been pen'd in a more *intelligible* Style, than the *Incondita Barbaries*, as he calls it himself, that now we have), *that the Serum was separated from the Chyle in the Receptacle, and did thence immediately pass to the Kidnys.* And for this reason the *first* and *second* sort of *Milky* Veins, from the Pancreas of *Asellius* and Intestines, seem to terminate in the *Receptacle* and Glands, the better to discharge the matter of *Urine*, and the *Ductus Thoracicus* to take rise *thence*, to convey up higher the *remaining* Juice for *Blood* and *Nutrition*. And whereas an *eminent*

Physi-

Physician mention'd before, to serve his own *Hypothesis* in the *Anatomy* of the *Liver*, in relation to the *Nerves*, says, *That these Glands are Perpusillæ in other Animals besides Man*: I never *yet* knew that Glands were observ'd in *this* place, in any *other* than Man, but in a *rare* case, which seldom happens, *when the major Glands of the Mesentery are wanting*; and find *this* made a sufficient *distinction* from the *Receptacle* in Brutes, by the Famous *Bartholinus*, that there is in *that* a manifest *Cavity*, when the *Glands* are more *Solid*. I confess in the *Cuts* of a young Professor of *Upsal* at twenty years of Age, I mean *Olaus Rudbeck* a *Swede*, publish'd by *Sibolduis Hemsterhuis*, in his *Messis Aurea*, or Golden Collection of *Anatomical* Inventions, *Fig X. Let. q.* I find a *Vesicula Chylosa*, or *Saccus Lacteus*, mention'd as discover'd by him in *Man* more answerable in Cavity to the Receptacle in *Brutes*; whether *with* or *without* the Lumbar Glands, the *Author* doth not say: but that the *Lumbar* Glands, which the Learned *Inventer* (whose Fame and *Fidelity*, notwithstanding all rude and petulant *Clamours*, are beyond exception) seems to make *peculiar* to Man, have at any time been observ'd in *any* Brute, in exchange for the Receptacle, I should be very glad to be inform'd. 'Tis true, *several* Glands, sometimes *three*, sometimes *five*, more or less,

less, have been observ'd to *supply* the place of the Pancreas of *Asellius* (being indeed but the *same* thing, only *one* large Gland divided into *many*) in sending Chyle to the *Receptacle*; but that any Glands in Brutes have supplied the place of the Receptacle of Chyle, when the *Receptacle* was wanting, I never yet had the good Fortune to observe my self, or read in any *other*. I know Dr. *Wharton* will have those *Lumbar* Glands to be of no more use in Man than the *common* Glands, or Pancreas in the Mesentery are in *Brutes*, to receive the Lacteæ of the *first* kind, and blames *Bartholinus* for making 'em a *Receptacle*, but where this *Receptacle* is doth not mention. So that unless he acquiesce in the *Vesicula* of *Rudbeck*, there can be no *other* assign'd than the *Thoracic Duct*, which is little different, the *Vesicle* of *Rudbeck* being no more than a *Duct*. In the mean time 'twill require some grains of allowance to believe, that a Ductus thro which the *Chyle* passeth, as the Blood doth thro the *Arteries* and Veins, and the *Breath* thro the Wind-pipe, should have the name of *that*, where the Chyle ought to make a longer stay; and pretty strange, unless by mere *opposition*, that *Rudbeck* should mention a Receptacle without *Glands*, and *Bartholine* Glands without a *Receptacle*, which he would not have done, had he own'd any *other* Receptacle or *Sac-*

ceus Lacteus than his Lumbar Glands; as is plain from the *first* Figure, *in de Lact. Thor. c. 7.* whence is this Title, *Receptaculum seu Compages nervorum Glandularum*, and at Letter F. *Glandulæ Lumbares Receptaculi.*

To make good the probability of a *shorter* Passage of Urine mention'd before, besides what *Walæus* affirms, that he at *Leyden* and *Riolanus* at *Paris*, as in the end of this *Digression* will appear, had seen some Branches of the Milky Veins, that did *discharge* themselves into the Vena Cava near the Emulgents, which must be into an *Artery*, as I have further urg'd in *another* Discourse in Latin on the same Subject, and for *that* reason not to insist too much on this: as to the matter in hand, I think I cannot make use of *better* Authority, than the first *Discoverer* of these Glands, who in his Tract *de Lacteis Thoracicis*, describing their Site, says, *They are plac'd beneath the Center of the Mesentery, under the Cœliac Artery and Emulgents, near the Vertebræ of the Loins, between the Muscle call'd* Psoas, *almost about the middle of the Space between the Kidnies and Capsulæ.* Quas uti & Renes, subinde tangit inferior glandula gemella, immediato contactu, vel missis ramis. Tho Dr. *Wharton*, in a Body perhaps not so fit for the Observation, could not find the *Communication.* And in *another* place he writes, *The Receptacle*

Rami ad Capsulas.

tacle in Brutes fills the ſpace between the Lumbar Muſcles, and reacheth ad Renem ejuſque Capſulam. The ſame Perſon before the full Diſcovery of the *Lymphaticks*, in a great Dog well fed, *obſerv'd* among other things, ſome *Ductus* very much like the *Milky*, ſometimes ſhewing *Milk*, and ſometimes *Serum*, to creep to the *Kidnies* by the Emulgents: and to compleat the Diſcovery, he further adds, *Spargebant glandulæ Lacteæ novæ ramulos ad ARTERIAM emulgentem dextram*; whereupon *de Lact. Thor. c. 7. Fig. 2. Letter E.* he hath this Explication: *The right emulgent Artery brought over to the left Side, to which the Branches of the Venæ Lacteæ proceed from the Glands*, as is plainly exhibited in the Copper Cut, where

A is the *right* emulgent Artery, for better demonſtration brought over to the *Left.*

B The *Branches* of the *Milky Veins* from the lower *double* Gland, that go directly to the emulgent *Artery* from the Lumbars, whence the Liquids paſs immediately to the *Kidnies* and Bladder.

C The *Thoracic* Duct from all the Lumbar Glands, that conveys the Liquids to the *Axillary* Branch of the Vena Cava, and ſo to the *Heart.*

d The *ſingle* Lumbar Gland.

e e The *lower* double Gland.

f f The Kidnies.

g g The

Reverendo Viro

D. GVILIELMO CLEMENT

Merito Votiva

g g The *Ureters* from the Kidnies to the *Bladder*.

h The *Bladder*.

The *Semilunar* Figure notes the *descendent* Trunk of the great Artery, cut beneath the Heart; opposite to which, between the *Back-bone* and *Ductus Thoracicus*, is part of the *Gullet*.

Witnesses to this at several Dissections, *Christianus Thomæus de Stougard* Knight, *Great* Chancellor of *Denmark*, and *Conservator* of the University, Noblemen and Gentlemen. *Jacobus Fabricius*, *Olaus Wormius*, *Simon Paulli*, *Paulus Mothuis*, *Henricus Fucrers*, *Jacobus Finckius*, and many other *Regius* Professors. To which the Author adds, *Quisquis tot tantisque nominibus fidem detrabit, ipse æternum cassa sit fide.*

Now whether the *Venæ Lacteæ* only *touch* or *terminate* in the part mentioned before, is the main *Hinge* the Controversy turns upon. I know our *English* Physicians, with Dr. *Glisson* and Dr. *Wharton*, whom they *chiefly* follow, were not so happy to light on what *afterwards* hath been discover'd by *other* Anatomists. Among more, I may instance in the *Vasa Lymphatica* of the *Spleen*, confess'd, *not* observ'd by *Wharton*, *Adenogr. p.* 13. *Glisson*, *Anat. Hep. p.* 516. the Learned Dr. *Charleton*, *Oeconom. Animal. p.* 178. and others, *demonstrated* by the Author of *Dilucidatio*

Valvularum in Vasis Lymphaticis & Lacteis, printed at the *Hague*, 1665. p. 42. *Fig. VI.* where it may be *noted* as pretty remarkable, that this *fifth* sort of *Vasa* in the Body of *Man* and other Animals, were *discover'd* by Dr. *Joliffe* in *England*, *Bartholine* in *Denmark*, and *Rudbeck* in *Swedeland*, near the very *same* time; and a great Contest happen'd between the *two* latter, about the Glory of *what* was due to the *former*. Whereupon a *German* Physician made this *Irenicon*.

Hafnia Barth'linum, Rudbeckum Suecia jactat,
Scotigenam præfert Anglia Joliviium:
Distribuatur honos, ne quis fraudetur honore,
Divisum Imperium cum Jove Cæsar habet.

In English;

Barthlin doth *Denmark*, *Swedeland Rudbeck* please,
England prefers their *Joliffe* to both these:
Divide the Honour, that all may have a share,
In Empire *Jove* and *Cæsar* Sharers are.

And

And altho Dr. *Wharton* and *others* were not ſo fortunate, we have no reaſon to *ſuſpect* ſo credible a Perſon as *Bartholinus*, in what he ſo *ſolemnly* aſſerts, and had obſerv'd in *ſeveral* human Diſſections, before *ſuch* Witneſſes, conſidering the grand Teſtimony he hath given of his *Fidelity* and *Skill*, in his *Anatomia Reformata*, and many other his Learned Writings Medicinal and Divine, but *eſpecially* what he ſays of himſelf as to the matter in hand: *De Fide noſtra & Sinceritate nemo candidus dubitet; nunquam publico impoſuimus, aut verba dedimus.* And in his Letter to *Martin Bogdan* againſt *Rudbeck* the *Swede*; *Inter minima reputavi ſiniſtra de me multorum judicia, maximæ famæ acceſſione ſemper æſtimavi bonorum applauſum, mentem recti veriq; conſciam, & publicam cui me emancipavi utilitatem; tandemque Deo innocentiam commiſi, eruditis cenſuram, omnibus candorem, & publicum juvandi Studium.* In which, as in moſt *other* controverſial matters, his Sincerity and *Candor* appear as conſpicuous, as the Purity and Eaſe of a fluent Stile. And I nothing doubt but *this* way of the matter of Urine paſſing to the emulgent *Artery*, and thence to the Kidney, whence ſome part returns by the *Vein*, and mixeth with the *Blood*, may find a *kinder* acceptance among the Learned, than the *peculiar* Duct of the noble *Bilſius*, called *Muſcus* or the MOSCH, which

he affirms to convey the Urinary matter from the *Lumbar* Glands, or those of the Mesentery, to the *Renal* of *Casserius*, to which *Bartholinus* had observ'd *some* Branches of the *Venæ Lacteæ* to come from the Lumbars, the Renal Glands seeming to me to *serve* the Kidnies much after the same manner as the *Auricles* do the Heart. 'Tis also very probable, that Urine in a Diabetes becomes sweet, from Chyle that passeth out of the lower Belly to the Kidnies, by the nearer way. And that ingenuous *Learned* Physician Dr. *Fuller* knew *One*, that instead of Water *pissed Chyle*, which 'tis likely came to the *emulgent* Artery by this *shorter* Passage.

To which I may add, that in an authentick Certificate I have seen under the Hand of *Samuel Walton*, then Lord Mayor of *Dublin*, with the City Seal, and *Jurat. coram me*, that a Person nam'd *Ruth Knot*, after other afflicting Maladies, had an Impostume in her right Side, which coming to break and run, she was of opinion, in the words of the Certificate, *That when she drank any manner of Drink, some part thereof came out at her side*, which probably was by this shorter way.

To this *good* Man and *great* Anatomist *Bartholinus*, I shall subjoin the Testimony of *Riolanus* the elder, who tho *proud* and *peevish* enough in other matters, yet here is more calm and *candid*, when in *Opuscu-*

lis Anatomicis he affirms, *Chyli partem a Glandula magna meſenterii, per venas lacteas chyliferas ſuperne, trunco Venæ Cavæ juxta ſubclavias; & INFRA juxta emulgentes infundi*: Where *Infra* may with greater Truth be better underſtood of the emulgent *Artery* than the *Vein*, which the ſagacious *Bartholine* on a more *accurate* ſearch had afterwards obſerv'd, and made old *Riolan* more unwilling *plainly* to confeſs what he cou'd not *deny*, leſt being *a Grandé* in Phyſick, and Dean of the Faculty at *Paris*, he might be thought to give too great *Credence* to a King's Profeſſor at *Copenhagen*, having not long before very *ſtifly* oppos'd among many other late Inventions, the new *Harveian* Diſcovery in *ENGLAND*, on no other ground than a *ſort* of Circulation of the Blood, he fancied was known *before* to *Hippocrates*. I muſt confeſs there is a *Sentence* in *Plato* [τὸ αἷμα περιφερόμενον περὶ τὸ σῶμα] he might have *better* inſiſted on, than the *fainter* Reſemblances in ſome words of *Hippocrates*. And 'tis on all hands granted, that whatever *Glimpſes* *Andreas Ciſalpinus*, *Padre Paulo*, and others in more *antient* times had of the *Circulation*, the *Demonſtration* was perform'd by the incomparable Dr. *Harvey*; and his intimate Friend Sir *George Ent* hath made appear, that what *Paul* the *Venetian* had, was *borrow'd* from the Writings of this Famous

Printed at Paris, 1652 Pag. 23.

Man. Besides, *Riolanus* and his Son being of a contrary *Persuasion*, and a cross-grain'd *Humour*, were never *well* affected to *either* of the *Bartholins*, as the *pious* Son expresseth in his *excellent* Preface to the *last* Edition of his reform'd Anatomy, 1655.

To make this Subject a little more *diverting*, I shall mention the Substance of a Letter from an eminent Physician, *then* in *England*, who had a long time been earnest with me to proceed on this Design:

"I hope by this time, Honour'd Doc-"tor, you have accomplish'd what you "intended; that there is a nearer Passage "for Urine than is yet discover'd, ap-"pears by this Instance: A young Wo-"man, not well in her Senses, came into "an Apothecary's Shop, where she saw "a Glass of Quick-silver; the poor cra-"zy Maid, taken with the Glittering, "swallow'd all, and in some short time "after voided it by Urine: The Quick-"silver pick'd up by Children was ac-"counted Pearls.

Perhaps this Evacuation might have been by *Siege*, and therefore I may mention with greater *probability* the Observation of *Andreas Laurentius*, Professor at *Montpelier*, who in his Anatomical Questions, writes, "He had often seen *Milk* in great quantity mix'd with *Urine*, which

might have occasion'd some Enquiry, *How such a sort of Urine could come by the great Artery from the Heart.* For certain it is, that Milk will not *mix* so well with Blood, as with a *thinner* Latex; and if the insipid part of Urine should be convey'd to the Receptacle by the *Lymphatics*, and there meeting Milk, both join the *salter* Serum in their passage to the Kidnys; the *Aorta* is excus'd, by a shorter way of passing, which *Laurentius* seems to have understood. Or, it might have been *Chyle*, or young white Blood not well mix'd with the red; which being of an oily nature, as is evident from its burning like *Fat*, when newly pewk'd up and spit into the Fire, doth not presently unite with the *old* Red, from which alone it receives its Tincture. Hence the *Surface* of the Blood, if taken when distribution is making, or lately finish'd, appears *White*, more resembling *Milk* than Whey; as among others, I formerly observ'd in a *modest* Servant of Dr. *Toope*, sometimes since a laudable Practitioner at the *Bath*, who knowing her self *barren*, desir'd me not to report that there was any *Milk* upon the Blood, for fear it might be thought that *she was with Child*: Or, it might have been *Chyle*, as Dr. *Fuller* observ'd, transmitted from the *Lumbar* Glands to the Kidnys; as Milk has oftentimes appear'd in the Urine of *Nurses*, and Wo-

men, newly deliver'd. *Est enim Lactis, adds* the same Author, *per Urinas expurgandi locus, breviorque ductus ad emulgentes, Ib. q. xi.* But more of this in *that* which follows, declaring the great good and *usefulness* of the new Invention, in *part* from the Author *.

From this discovery, appears the *reason* of many affections in the Body of Man, which *before* we were either *ignorant* of, or constrain'd to go a *farther* way about to understand.

For by a *shorter* Passage 'tis plain, how *Promachus* the *Macedonian* could drink *four* Gallons of Wine at one Sitting, *others* say at *one* Draught; *Novellius* the *Roman Tricongius*, *three* Gallons at one Heat, in the presence of *Tiberius* (who in his younger days being a great *Tiper*, instead of *Claudius Tiberius Nero*, got the name of *Caldius Biberius Mero*) and *Domitius* the *drunken* Emperor, by *Aurelianus* call'd the *Pitcher*, exceed them and all Mankind in drinking, and in a very short time after render it again by *Urine*, as did *Bicongius*, *Tully*'s drinking Son, when he drank *two* Gallons, which was his usual Custom.

The *way* by the Liver, Heart, Arterys, Emulgents, Kidnys, Ureters and Bladder, *commonly* receiv'd and depended on,

* De Lact. Thorac. &c.

is much too *long* for ſo quick an Evacuation. And tho *Aquapendens* labour'd much to find a *ſhorter* way to the Liver, by the Veins that *derive* from the Stomach; and *Piſo* and *Conringius* to diſcover a *nearer* Paſſage to the Spleen: The *firſt* loſt its Credit when the Circulation was diſcover'd, and the latter could never be *ſeen* by any credible Perſon, being only conjectural Products of their own Imagination.

It appears alſo in a legitimate *Diabetes*, why any ſort of Drink, eſpecially the more *penetrating*, arrives ſo ſoon at the *Kidnys* and Bladder, in a manner the *ſame*, as when taken in at the *Mouth*.

This, beſides the Teſtimonys of *Galen*, *Trallianus*, *Aetius*, and others, is confirm'd by later Experience.

Amatus the *Portugueſe* * mentions *one* much given to drink Wine in *great* quantities, and ſoon *voided* the ſame by Urine, without *alteration*.

Herculeſ Saxonia † ſaw a noble *Venetian*, that uſually drank at Dinner thirty four Glaſſes of Wine for many years together, and voided it as *quickly*.

Victor Trinca Veſtius ‖ mentions *one*

* Cent. 2. Cur. 94.

† Prælect. pract. part. 2. c. 34.

‖ Prax. l. 10. c. 2. Et Epiſt. xy. Theoph. Varin. Brixienſi de Diabet.

that

that drank so much *Cold* Water in a Fever as caus'd a *Diabetes*. The Water he made was nothing different, he says, from *common* Water, in Consistence, Colour, *Tast* or Smell.

I somewhat doubt whether this was a true Diabetes, because the *Tast* of the Water was not alter'd, as *now* is usually observ'd in *that* Distemper: He was Brother to a Cardinal, and lost his Life by drinking Water *too cold*, as the Author declares*.

Zacutus Lusitanus † hath a Case exceeds *that*, and almost *Belief*; that a Person he knew, drank *ten* Quarts of Wine in an hours time, and that it came away by Urin, as *clear* as he drank it.

An Abbess ‖ did the *same*, when she drank *any* kind of Liquor in her great *Drought* from a Diabetes, and voided all sorts of Liquids, the *same* as she took them.

Salmuth ** observ'd in a great Drinker of *Wine*, that when he was *full*, he did commonly void it *Crude* in substance; both

* Interiit Frater illustrissimi Cardinalis Pisani, neque aliquis ibi fuit qui non judicaverit, id ex potu *nimium* frigido accedisse. *Trinc. Ep. & Cons. p.* 825. (*Folio.*)

† Prax. Adm. l. 2. Obs. 71.

‖ Lady Abbess Mutiana, Trinc. Ep. 15.

** Cent. 2. Obs. 95.

Colour

Colour and *Smell* the ſame, but would not *taſt* it.

Benedictus Sylvaticus, that great Practitioner, told the Famous Dr. *Barholine* *, when he was at *Padua*, that he ſaw a Perſon piſs *Claret*, nothing different from what he drank.

The ſame learned Phyſician *relates*, that being *troubled* with the Stone, in a great fit, which gave him much *Torment*, he drank ſome *Rheniſh* as a Diuretick, which came from him very *clear*, and continu'd ſo in the Urinal for a conſiderable time, without *alteration* in Colour or Subſtance.

So that let Practitioners lay the blame as long as they pleaſe on the Indiſpoſition of the *Kidnys*, the *Laxity* of the Paſſages, the *Weakneſs* of what they call the *Attractive*, *Retentive* and *Commutative* Faculties, they can never give ſatisfaction, unleſs by a *ſhorter* way of paſſing, how *theſe* and *other* Liquors taken into the Body can come from it ſo *ſuddenly*, without *mutation* of Subſtance, or *mixture* with the Blood, as hath been *obſerv'd* in Countrys where *Wine*, not *Beer* and *Ale*, was a common Drink.

By *this* alſo we underſtand how *Milk* or *Chyle* can come by Urine. *Nicolaus* † the

* De Lact. Thorac. c. 9. p. m. 75.
† Sect. 5. tr. 10. c. 21.

Floren-

Florentine saw a young Soldier of thirty years of Age, that *every* day made a great deal of Urine, that had a *white* bottom like coagulated Milk; the Urinal was half full of such a white *cloudy* Substance, with *clear* Urine on the top, without *Ulcer* or Imposthume. *Felix Platerus* * relates of himself, that he made Milky Urine for a long time together, without *any* inconvenience; and that upon Settlement, one or two Spoonfuls of something *White* did remain at the Bottom no thicker than *New Milk*, which was not the Product of any Disease. Many other things are mention'd concerning white *Milky* Urines in *Actuarius* † and *Theophilus* ‖, *lately* put forth by my self in Greek and Latin, printed at *Leiden*, 1703.

'Tis easier also *this* way to understand, why Medicines against the *Stone* or Gravel in the Kidneys give ease so *soon*, and why Provocatives have so *quick* an effect on the Emulgents and *Spermaticks*, which otherwise would lose their Virtue by a *longer* Circuit.

By *this* way Diureticks retain *Colour* and *Smell*, such as Turpentine, Asparagus, Cassia and Juniper: To which I may add a *pretty* Story of *Actuarius* his Ser-

* L. 3. Observ. p. m. 836.
† De Præviden. Urinar. l. 1. c. 2.
‖ De Urinis alibis c. 6. χεῶμα γαλακτῶδες.

vant

vant *, who when he was ſick, being nice and moroſe, was compel'd by his Maſter to take the *Bitter Troches* mix'd with Oxymel; upon which he made *Black* Water, and was afraid his Maſter had *kill'd* him by giving him *that* Medicine.

Beſides, no man can tell, if not by a *ſhorter* paſſage, which way many *ſtrange* things have come by *Urine*, that have been ſwallow'd the ſame way with our *Food*, and could not poſſibly come thro the *Heart*.

The Story of the *Venetian* Virgin is as notorious, as that of the *Epheſian* Matron; ſhe ſwallow'd a ſilver *Bodkin* four Inches long, which remain'd *two* years within her Body without *Offence*, and afterwards voided it by Urine, cruſted over with a *ſtony* matter. This is mention'd by *Schenkius* †, *Sanctorius* ‖, *Paræus* **, and others.

Hairs have been often voided by Urine, *Parſly Roots*, *Fungus*, *Flys*, *Aniſeeds*, *Winter Cherry-ſtones*, *Barly Husks*, *Small Coal*, *Green Herbs*; and what is very remarkable, moſt part of a *Sallet* eaten at Supper by a Maid at *Amſterdam* came from her by *Urine*, as was obſerv'd and reported by

* De Jud. Urin. l. 1. c. 20.
† Pag. 3. Obſ. 6.
‖ Meth. Vit. Err. l. 4. c. 11.
** L. 24. c. 19.

that

that celebrated *Anatomist*, *Johannes van Horn*. To which I shall add what I had from Mr. *Henry Dyer*, *sometime* Surgeon to *Bellot*'s Hospital in *Bath*, that he saw *Broth* with Marigold Flowers *plainly* appearing in it, come from a Patient he us'd to dress in *that* Hospital, who had an *Ulcer* in the Back or Thigh.

I could cite *Authors* for every one of these Particulars, if I thought it necessary; but I now *forbear*.

Further, hence it may appear why *great* drinking in some *short* time brings the *Dropsy*; the Coat of the *Peritonæum*, with which the *Milky* Glands are involv'd, being fill'd *too* full, whence the Liquors break out into the *Cavity* of the Belly, as was sometime observ'd by an excellent Anatomist * in an *intimate* Friend. Neither is there any *other* more probable reason for the way of *Cure* of a Dropsy by *Diuretick* Remedys, and terminating by *Urine*; when fusing of the Blood in *Baths*, or otherwise by *Heats* and *Sweats*, proves often *dangerous* and sometimes *fatal*. But above all; the great *Atrophies* that attend sickly Persons and cause *Consumptions*, are more owing to the faults of the *Milky* Veins and Glands than to any *other* Cause whatsoever, by which the parts that shou'd

* Th. Bartholin. de lact. Thor. c. 9. p. m. 81.

be

be *duly* nourish'd, are *too* much increas'd or *diminish*'d in bulk: This appear'd *plainly* in a Body sometime dissected, in which every part besides the Liver *wasted*. The Lungs *too* soft and flaccid, were spotted like Marble, a Tumor on the *Groin*-Gland, the Foot *gangreen'd*, with many other Signs of an *ill* habit of Body. One of the Thoracic Glands was *well*, the other *sick*, red and inflam'd like a Phlegmon.

The *Liver* and many of the *Meseraic* Milky Veins sound, the Milky *Thoracic* empty, flag, and in much *worse* Condition.

Many *other* good uses of this Discovery may appear in time; and if any Person can produce a more *certain* shorter Passage from the Stomach or *Guts* to the Kidnys than I have propos'd, by which those Appearances in Nature, and perhaps many *more*, may be better solv'd, I shall be so far from *Envy*, that I shall *rejoice* at his good Fortune, and own it with as *much* readiness as I have done the *other*.

Neither shall I be so *ill* natur'd to act over *again* the part of *Riolanus*, who so lightly esteem'd the Discoverys were made by *Neighbours*, he thought so much *inferior* to his own Nation; tho (not to say any thing of *Britain* here) if we believe *Swaningius*, the *Danish* Chronologer, the Kingdom of *Denmark* was *long* before the Rise of the *Merovian* Family in *France*, *Anno Christi*

Christi 420. by *Pharamond*, beginning *Anno Mundi* 2910, and 1038 years before the *Birth* of our *Saviour* *.

In the mean time, till *that* be done, *this* may suffice to shew the *glimmering* Light that went before: and if from a more *happy* Experiment in Anatomy *since* I have again reviv'd, and perhaps *demonstrated* a thing very useful in the *Oeconomy* of Man and other Animals, as the *immortal* Dr. *Harvey* did the *Circulation*, which former Authors by words only and faint expressions may have *pointed* at; it may encourage Physicians that begin to grow *lazy*, to study more, and read *Books* as well as *Men*; from the Fable of the *Cock*, who turning up and down an useless *Heap* of Earth, lighted at last on a *Pearl* of no *common* Value.

And had I not cited *good* Authority, I might have been thought *either* to have vented my own Fancy, or forgotten what in times of Study I had *formerly* read. The *idle* Opinion that possesseth most men of the Faculty *now* is, That all is done by *former* Authors, and yet, most ungratefully, will not vouchsafe to *read* their Works, nor consider the *Truth* of

* *Confirm'd by* Georgius Sadolinus, Jonas Koldingensis, Claudius Lysander, *a MS. in the Royal Academy at* Copenhagen, *and the* Sueogothic *Chronicle.*

what

what *Seneca* says, *Multum operis restat, multumque restabit.* There is *yet* a Reward left for *Diligence* and Industry in Anatomy, and the Chymical and *Methodical* way of Practice; and those that speak so *briskly* of reducing Physic to so narrow a Compass as *four* things [*Mercury*, *Opium*, the *Cortex* and *Steel*] do just the *same* as Author-Jobbers did heretofore, that *epitomiz'd* Books, by which after Ages were sure to want the *Original*, as in *Trogus*, *Verrius*, *Pacuvius*, *Epimenides*, *Ennius*, *Menander*, *Lucilius*, *Cato Major*, and many others; of which, as a *Table* after Shipwrack, the miserable *Fragments* do remain, we *sadly* experience.

I shall only mind these *Physick-Book* Worms, that they are well *discover'd* and treated by a *late* Author on that Subject, in these words: "Some pretending men make the whole Art of Physick consist in compiling ingenious Systems, and preferring their own Imaginations before whatever the experience of our Predecessors have been able to inform them, which they will not take the pains to read; *the Ignorance of which is certainly very much to the Shame of those that ought to know more than Vulgar Physicians.* Dr. Andry.

I further *add*, the Discovery was made in *Denmark*, the Illustration *only* mine, and may serve at *least* to revive so much

of a *rare* Observation, if not give a *whet* to a farther *Enquiry*.

But to leave this *Digression*, which chiefly respects the *ordinary* passage of Urine, nothing doubting but that in Cases *extraordinary*, if not in great *Drinkers* of potable Liquors, mention'd *before*, yet in those that drink Water at the *Bath*, and *other* places with more Discretion; some *part* of what they drink may enter into, and *alter* the Blood, passing by the Thoracic *Duct*, and Subclavian Branch of the Cava into the *Heart* (but not without apparent hazard of extinguishing a *vital* Flame) besides what may pass out of the *Emulgent* Artery into the Vein, and circulate with the Blood, according to *that* Doctrine. And indeed, this *collateral* way of passing seems more *natural* and easy, than a *perpendicular* Ascent in an *erect* posture in the day-time; whereas the *Chyle*, and other Juices mix'd with it, may have a *better* advantage of passing to the Heart by the *same* Ductus, from *another* sort of Posture of the Body in the Night. But to leave this *Digression*, of which I have *elsewhere*, in the Prolegomena to *Theophilus*, Περὶ Οὔρων (lately publish'd) more *fully* cours'd, and return to the *viscid* matter in the Rheumatism.

Or Preface.

To put the Debate out of all *question*, whether Bath-Heat would *coagulate*, I caus'd a considerable quantity of the Succus,

cus, commonly call'd *Serum*, to be separated from the *Blood* of a Rheumatic Person, and put *some* into a slender long Vial, *more* into a thin Bladder well bound, and laid *both* upon the hottest Springs of the King's Bath, from *six* at night to *six* in the morning, and found the Fluidity to continue in *both*, with little alteration of *that* of the Vial; but the transparency of *that* in the Bladder, alter'd *somewhat* to the consistency of a *turbid* Whey, which the Flame of a Candle did soon *coagulate*.

'Tis further to be *noted* in this Experiment, that in the same Succus, taken from the Springs, preserv'd and expos'd to the *cold* Air in the Winter, some *Coagulation* was observ'd, which did not appear while the Succus was *Hot*; whence to me it seems very probable, that the over-heating of this Succus in the Body first, and *chilling* of it afterwards, which the common People call *Heats and Colds*, is the *truer* Cause of Rheumatic Distempers.

The same sort of Blood I have observ'd in *Cooks*, *Smiths* and all sorts of *Firemen*; and in labouring Cattle, as Horses, Oxen, *&c.* and seems to owe its *Origin* to no other Cause.

Much of the same Opinion is Dr. *Musgrave*, only he thinks *Cold* * in this Distemper

* Semper incipit a Frigore, causa hujus affectionis

temper to precede *Heat*, and affirms that sort of Rheumatism that attends the *Gout* to proceed from *Cold*, which in some short time, after great exercises, brings a *Lentor*, which we commonly call a *Size* upon the Blood: What I have found *most* successful in the Cure, are Medicines taken from *Fumitory*, *Antimony* and *Elder*, as the Cases mention'd in my *Observations Medical* do make appear. The *like* Experiment I made upon *Eggs*, and found little or *no* alteration in the *White*, by the Springs of the *Bath*.

P. 51. What relates to the great *Explosion* of Spirits in *Convulsions* from the *Heat* of the Bath, which is the *grand* Objection of the famous Dr. *Willis*, in his Book *De motibus Convulsivis*; I have return'd Answer to all the Cases therein mention'd that concern the Bath on *another* Occasion, which I intended to have annex'd to this Discourse; but considering it was the doubt of another Person, I have confin'd my self in *this* Apology, to what I find in the *Enquiry*.

In the *mean* time I cannot but think, with the observing Author, 'tis a great Inconvenience, that there is not a more

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nis evidenti fidissima, ex qua celerrime Sanguini præcipue vero ab exercitationibus incalescenti, Lentor inducitur. *De Arthr. Symptomat. Dissert. c. 2. Art. 2.*

con-

constant *steady* Heat generally kept in the Baths at *Bathe*, the *main* cause of Offence in *Convulsions*. For the sudden *Increase* and Decrease of Heat, chopping and *changing* the Springs, adding or *subtracting* Water, to make the Bath *Hotter* or *Cooler* at pleasure, as it occasions *Exacerbations* in many Diseases, chiefly *Convulsive*, and in Hypochondriac, Hysteric and Nephritic Passions; so it frustrates many *other* measures may be taken for the Patients good. P. 63.

This way of letting in or *keeping* out the *main* Spring, was at *first* design'd to prevent, what was usual in other Places, any mixture of *Cold* Water with the Water of the Bath; which was then more under government of such Persons, as had a more *immediate* care of the Bather's *Health*: but since the management of the Bath hath fallen into *other* hands, they will order Baths as *they* please, without the knowledg of a Physician; yet that some *alteration* in Heat is necessary, I *readily* grant, tho not on a *slight* occasion, or at the request of every *single* Person.

The *Long* Bath (commonly, but improperly call'd the *Hot* Bath, when all the Baths are *Hot*, upon which I thought fit to *alter* the name) is the *only* Bath in the City that cannot be *vary'd* as to degree of Heat. The *Cross* Bath is the most *temperate* Bath of all, and temperate enough

P. 9. for *any* Person, tho the Author seems of *another* Opinion. This Bath ought to be kept *temperate*, with the Water arising from its *own* Springs, not taking from the *Long* Bath what it cannot well spare, nor advancing its *own* Heat above the degree of *temperate*; that the Physician may be more *steady* in his Advice, and the Patient so advis'd receive the *greater* Benefit: For 'tis the *temperate* Baths that are of most *diffusive* use, not only to the Generality of Men, Women and Children, but also to correct the *Excesses*, and supply the *Defects* of the *Hotter* Baths here, and the *Colder* Waters in other Places.

And had I pretended to so great a Deference to the *antient* Writers (whom I very much esteem) as our *Learned* Author doth, I should have thought I had
P. 9. much offended in not allowing the *Cross* Bath to be *temperate*, and (the contrary to which is so evident to every Person) *not to moisten*.

Aristotle, accounted the Prince of *antient* Philosophers, in his Doctrine of the Elements, makes *moistening* inseparable from the nature of an *Humid*. The same Philosopher in his History of Animals, and *Athenæus*, *l.* 7. use the word ὑγρὸν, or *the moist thing*, for Water. *Homer. Od. A. & Oppian in Halieuticis*, call the *Sea* ὑγρὴν, or the *moist*, *wet Element*; and therefore
. 56. with greater reason in *another* place, but

with-

without any great Consistency with *himself*, our Author will allow the *temperate* Baths to *warm and moisten.*

Page 9. he says, *The Cross Bath is much too hot for a Temperate Bath*; and pag. 56, *Baths by their Temperate Heat warm and moisten.* So that he seems to conclude, that since the Cross Bath hath not a temperate Heat, *it doth not moisten.* Now what that is which *restrains* any Water Hot or Cold, or any Bath, *temperate* or not, from *moistening* any thing that is put into it, our great Philosopher would *oblige* us to inform us. The only reason why the Cross-Bath is not always temperate, is because it too often receives *over* hotter Water from the *Pump* of the hot Bath; when the Water from its own Springs is *temperate* enough, and doth not *tender* the Skin, as other Baths do; the *Pores* also being render'd not too *open*, nor the Sweat *violent*, good effects are with more *Security* perform'd there than in a *Colder* Bath, beneath a *Temperate*. *Pumping* ought to be very cautiously us'd on the *Head* in hot Distempers, being more agreeable to Persons of *Cold* Constitutions, as this noble Author very well observes. The *Naps* of the *Neck*, *Shoulders*, *Chine*, *Stomach*, *Belly* and *Hip*, may receive a *greater* number of Pumps, the Limbs and Joints *fewer*: and if the Pumper was guided by the parts of an hour, the Patient might receive much

Pag. 9. Pag. 56. Pag. 46.

greater Benefit. This was the antient way and *custom* here, before *Pumping* succeeded in the place of the *Douse*, which was not always *safely* attempted. I have read of *One* that, before Pumping was in use, lost his Eyes by a Defluxion occasion'd by the Fall of the Water on the *Head* by Bucketing. And Dr. *Mason* got no great good by Bathing or *Pumping* in an Apoplexy, as this Expression in his Epitaph makes manifest; *Ad aquas has medicas iter instruit, Apoplexia (heu frustra) in medelam, unde mens tandem corpore soluta, purior, velut è Balneo, ad cognatos Spiritus evolavit.* Lady *Nichols*, *Salutem hic quærens, invenit mortem*; and the Learned Dr. *James*'s Epitaph, calls these Waters *Fatheries*. But I *forget* I am writing an *Apology*.

I agree with the *ingenious* Author, that the Waters of the Bath are *best* drank in Seasons most free from *Rain*; and therefore in *Frosty* Winters and *Dry* cold Seasons they are more effectual, than in Wet and *Open* Weather. *March* and *May* are Months generally without exception, and *any* Month so qualify'd *after* or *before*.

The unreasonable *long* stay in the Bath at *one* time is a *great* Abuse; an Hour or between that and *two* is sufficient; longer stay debilitates, and procrastinates the *Cure*. *Antonius Guainerius*, in his Discourse of Baths, mention'd *Op. de Baln.*

pag. 43. determines the Time, till the *Fingers begin to ſhrivel*: *Semper in Balneo tanta ſit mora, donec Digitorum pulpæ in rugis contractæ fuerint*, *cap.* 4. Yet how *much* longer many Perſons commonly ſtay in the Bath to *haſten* the Cure, and find the *contrary*, I need not mention: 'Tis therefore *well* obſerv'd by the Author, *That bathing till the Parts begin to ſwell, nouriſheth them; but longer Continuance brings a Waſt.* P. 64.

Night-bathing, unleſs to the meaner ſort of People that eat and drink but *little*, and cannot do otherwiſe than live a *temperate* Life, if not prejudicial, is of much *leſs* uſe than bathing in the *Morning*: And whereas the Author commends this to the practice of the *Gentlemen*, that come to the Bath for *Recreation*; he ought to conſider that many *Gentlemen*, and moſt *Noblemen* eat *late* and ſometimes *drink*; ſo that the Body cannot be *empty*, nor in *ſuch* Condition as the *Bath* doth require, as the Author *well* obſerveth in *another* place; and therefore it ſeems more adviſable to *forbear* the Bath, or uſe it at *ſuch* times as others do, that expect *Benefit* from the ſame. Pag. 53. Pag. 3.

That the *end* of the Spring and *beginning* of Autumn, are the *beſt* times of Bathing in Hot Baths, not to hinder a *Reſort* to *Buxton*, I grant; but that the *Summer*, part of *Autumn* and *Winter* too, have prov'd beneficial to *Bathers* at the P. 46, 47, &c.

Bath,

Bath, the many Instances *already* publish'd in a *Register*, containing two compleat *Centurys* of Bath-Cures, most my *own* Patients, to which a *third* had been added, which was the *only* Copy and miscarry'd at the *Press*, do sufficiently declare.

And whereas the Influences of a *Dogged Syrius*, are generally more dreaded than the *kinder* Heat of the Sun, 'tis well known that the Heat of the *Dog-days* is oftentimes so allay'd with the *Tears* of *St. Swithin*, that the Weather rather seems an *Autumn* before its time, than the *Overheating* Season of the *Summer*, which was usually made the *Vacation* at *Bathe*.

That *Autumn*-bathing so much *opens* the Pores, as to prejudice the Bathers in the *approaching* Winter, which he gives in caution to his Countrymen for their *greater* Benefit, hath as little Sense or Reason in it, as *That the Cross-Bath doth not moisten, because 'tis not temperate.* P. 47.

To sum up all, I shall *ever* write about the Bath. "Tho common Good and E-"quity incline me to desire that the hot "Baths, temperate and cold, may have "all their due and proper uses; yet the "colder Baths being most advisable in "hottest Weather, the hot Baths at "*Bathe* have the advantage of colder "Waters of *Buxton*, *Litchfield*, *St. Chad*, "or elsewhere, by nine Months in "Twelve,

" Twelve, and all ought to be us'd with " good advice, in proper ſeaſons. To " be brief, Cold Baths may better rectify " and ſuppreſs the wild irregular Moti- " ons of the Blood and Spirits, where " they are exorbitant, as in Mother, " Spleen, Convulſion, Vapours, Rheu- " matiſm, Manias, Phrenſys, Calentures " and other Diſtempers, with which " Thermæ do not agree; over-rule " Heats, and moderate the mad Efforts " and Extravagancys of Nature too much " upon the Fret: but what Friends they " have been and ſtill are to nervous Parts " ſo numerous, and uſeful for ſenſe and " motion, in Fibres, Membranes, Inte- " guments, Ligaments, and other white " Parts commonly call'd Spermatick, for " which Baths of another kind, with " greater Succeſs, have been handed " down to ſucceeding Generations, ſince " the days of *Hippocrates*, *Celſus*, *Galen*, " and other Princes in Phyſick, 'tis not " difficult to determine.

Beſides, no Cure from *Cold-water* ſo conſiderable among the *Romans*, as that of ſickly *Auguſtus* by *Antonius Muſa* in *Diſtillations*, and the *ſore* eyes of *Horace* from an Inflammation; whereas *Cornwel* Water in the Suburbs of *Bathe*, any *Cold* Water elſewhere, or any old *Woman's* Receit for a Water for the Eyes might have been as *Famous*, and occaſion'd a

Statue

Mre collat. Suet.

Statue set up by *Contribution*, had it *then* been known and us'd by *Cæsar*, who in a *desperate* Condition happen'd on *relief* by such means, of which the *Historian* could give no better Character, than of a *contrary* and *dangerous* way of Cure; as it afterwards prov'd to young *Marcellus*, whom the Author, in the Epistle Dedicatory to his *Grace* the Duke of *Devon*, affirms, that *Musa* in plain terms *KILLED by Cold Bathing, but six months after he had cur'd* Augustus.

A public Loss, if that *Marcellus*, as is most *probable*, was the Son of *Octavia* Sister to *Augustus*, whom he intended should *succeed*; and may renew our Grief, for the *untimely* Death of that *hopeful Princeps Juventutis*, the *late* Duke of *GLOUCESTER*.

Tu Marcellus eris, magna spes altera Gentis.

But to do the *chief* Physician to *Augustus right*, *Marcellus* Nephew and adopted Son of *Augustus*, whose *neat* Effigies from a *Coin* of *Ursinus*, may be seen before the *late* compleat Edition of *Livy* in *English*, *buried* with so much State, and *lamented* so much by *Virgil*, at the end of the 6th Book of his *Æneis*, had a lingring Sickness from sixteen years of Age to three and twenty, *Propertius* says but twenty, of which he then died in *Tabiana*, as *Servius* on the place, in the time of his Ædilship.

Pto-

Ptolomy ſays, that *Tabiana* was an *Iſland*, like to that of *Tylus* in the *Perſian* Bay: This is atteſted alſo by *Stephanus* and *Marcellinus*, who calls it *Tibiana*; but *Marcellus* probably died *nearer* home.

What Authority maintains *Marcellus*'s *Death* by *Muſa*'s *Cold-water*, among Authors of undoubted Credit, only *one* excepted, I am a Stranger to; or where *Tabianum* was beſides, unleſs near the Hill *Tabiæ*, famous for the beſt *Air* for Conſumptive Perſons; as *Tuſculanum*, *Tully*'s Country Seat, from *Tuſculum*; and *Formianum* from *Formiæ*.

Lipſius upon the *beginning* of the Annals of *Tacitus*, from an *Italian* Poet that writ an Elegy on the *Death* of *Marcellus*, ſays, *That* Claudius Marcellus, *Nephew to* Auguſtus, *died not without ſuſpicion of Poiſon by* Livia *at* Baiæ: Or *rather*, as the Learned *Scaliger*, whoſe opinion he *rejects*, in *Stabiano* near *Stabiæ*, not far from *Baiæ* in *Campania*, where the *Hot* Baths were; and preſuming on the *Teſtimony* of *Propertius* the Poet, born in *Umbriæ*, reads in the printed Copies of *Servius* his Comment upon *Virgil*, in *Baiano*, and not in *Tabiano*, as in the *Comment* we uſe. He endeavours alſo to *reconcile* the difference from the *nearneſs* of the Places, but makes no mention of *Antonius Muſa* or any *Cold* Water.

The

The *single* Author for the Death of *Marcellus* by *Cold* Water, I at present find is *Dio*, who writes of *Augustus* [Ἀντώνιός τις ὁ μάσσας ψυχροσωρείαις ἀνέσωσε] *That one* Antony Musa *preserv'd him by Cold-bathing.* A little after discourſing of *Marcellus*, he *delivers*, that *Marcellus* being under *Cure* by the ſame means that *Musa cur'd Augustus* by [ἀπέθανε] *he died.*

I ſhall but *gently* touch this *tender* place in Hiſtory, which *Joſeph Scaliger* and *Juſtus Lipſius* had ſuch a *Conteſt* about.

'Tis ſuppos'd even by *Dio* himſelf, that the Empreſs *Livia* was the *Cauſe* of *Marcellus*'s Death by *Poiſon* (which brought on him that *lingring* Sickneſs of many years Continuance, mention'd by *Servius*) becauſe he ſaw him *prefer'd* before her own Children [Ὅτι υἱέων αὐτῆς προετετίμητο] upon which *Lipſius* calls her the *Court Medea.*

After Poiſon was *given*, the *Royal* Youth never enjoy'd himſelf, but *pin'd* away till he was at leaſt *twenty* years of Age; and when the time came that he muſt *Die*, it was greatly debated *how he died.*

Propertius, no doubt, knew the truth of the matter, being in ſo *much* favour with *Auguſtus* and the *Court*, but loth to diſcover for fear of *Livia*, which might have coſt him his *Life*; and therefore the learned *Scaliger* ſays, *That he rather choſe*

to

to flatter Livia, *than to bring himself into danger by telling the Truth.* In that Elegy of his third Book, beginning thus, *Plausus ab Umbroso*, he says of *Baiæ* and *Marcellus*, as *plainly* as he then could do, to fix the *Death* of *Marcellus* there:

His pressus Stygias vultum demisit in Undas,
Errat & in vestro Spiritus ille Lacu.

This *Beroaldus*, tho he *explain'd* the *other* parts of the Elegy with much Truth and *Learning*, did not understand; when 'tis plain, *Propertius* means a *violent* Death, for *Pressus* there declares *Force.* The Distich I thus translate:

Prest down, unto the Stygian *Shades he goes;*
And in your Lake his wand'ring Spirit flows.

This rais'd *Scaliger*'s passion in his *Notes* upon the place to an *Admiration*, how *Propertius* could write *thus* against his own knowledg; and he cites *Dio* to the *contrary* for *Marcellus*'s Death by *Cold Water*, to the *dishonour* of *Musa*, and judges he died in *Stabiano*, in the *Coldest* Water there, call'd *Dimidia*, mention'd by *Pliny*, *l.* 31.

Lipsius was of opinion that *Poison* would have had the same *effect* in *Baiæ* as in

in *Stabiano*, about which they could come to no accord. At length *Scaliger* found in *another* antient Commentator upon *Virgil*, then in the hands of his *Friend P. Daniel*, that at the *Funeral* of *Marcellus* there was an *Oration*, in which *Augustus* declar'd, *That* Marcellus *was devoted on the Mountain* Mintur.

So *variously* reported is the *Cause* of the Death of the *Beloved Marcellus*; and so *hard* a matter it is, when *mischief* is done in a *Royal* Family, to know who did it; Authors at that time being unwilling to *displease Augustus*, not sufficiently *aware* of the subtle *Tricks* of his crafty *Livia* to advance the *Tyrant*, as the Historian deservedly calls her *Son Tiberius*.

As to the *precise* time of six months, *Dio* says no more than [ὑ πολλῶ ὕστερον] *no long time after*. To clear this matter:

The *Sea-fight* at *Actium*, where *Augustus* overthrew *Mark Anthony*; *Isaac Casaubon*, and most *other* learned Men, *put* to the year of *Rome* 723, the 13*th* of *Augustus*: On *Augustus*'s *Triumph* for that Victory, *Marcellus* about 12 or 16 years old, according to *different* accounts, having a *Led Horse*, was plac'd on the *right* hand of *Augustus*, as *Suetonius* observes, and *Tiberius* on his *Left*; which rais'd a Jealousy in *Livia*, and 'tis probable was the Cause of *Marcellus*'s Death by *Poison* of a slow-working nature, as hath been lately

Tiber. in Princ. c. 6.

lately practis'd in *France* by *Brinvilliers* and her *Confederates*; after which he might live ſome time in a weak and *languiſhing* Condition, and was eaſily *drown'd* at *Baiæ* at 20, as *Propertius* relates, near *A.U.C.* 728, 18 of *Auguſtus*, about which time *Auguſtus* might uſe *Cold Water*; and ſometime after *Marcellus* dies, the exact time, *how long after*, is not there expreſs'd.

But to ſet this matter beyond *further* Debate: *Helvicus* placeth *Pugna Actiaca* to the 13*th* of *Auguſtus* (*Sept.* 2.) and *Antonius Muſa Medicus Auguſti* to the 20*th*, about which time *Marcellus dy'd*, and pin'd away ſeven or eight years before, according to *Servius*; born in the firſt year of *Auguſtus*, if *Propertius* be in the right; *three* years before, if *Servius* be *true*, who writes *Marcellus* liv'd to the age of three and twenty.

To purſue the Story of *Muſa* a little *farther* than hath been done by *others*; *Dio* in his 53*d* Book, where he treats of theſe matters *more* at large, makes no mention of a *Statue* ſet up in *Honour* of *Muſa*, which probably he would have done had the Emperor *commanded it*; and thoſe that have read *Suetonius*, find *other* things in him that require *Faith*, as the Learned *Caſaubon*, in his Elaborate Comment upon him, and *Juſtus Lipſius* upon *Tacitus*, make further appear. *Euſebius* in his Chroni-

cle, drives the matter to the *end* of *Musa*, and writes, *That he lost his Life in Sea-water.* 'Tis thought by *Shipwrack*; and so *Casaubon* understands *Eusebius*. Upon which I shall make this Remark, That the Physician's *Man*, in the comical Story from the *Bath*, who by an *accidental* Fall from a *narrow* Bridg, which did not *break* his Neck, stood up to the *Chin* in Fresh-Water for a *Cough*, and recover'd; sped *much* better than the *Master* Physician to the Prince of all the World did in *Salt-Water*, tho he there found a Remedy for *all* his Diseases.

Ad Suet. A. c. 59.

Cold Bath, p. 265.

It may be *also* noted, that *Sea-Water* having some *degree* of Heat, and more common *Salt* and Mineral *Niter*, than any insipid *Cold* Water can pretend to, may in all probability be a *better* Bath than a *chilly* One, no better qualified, than on the account of its *Cold*. *Galen* starts the Question, *Whether any Mineral Water drank cold can do any good?* And gives the reason Dr. *Jorden* took from him, for his *Dislike* of the use of Bath-water in Potion, *the Uncertainty of their mixture*, and such says he, as cannot be discover'd but by *Experience*, which *Hippocrates* affirms to be *Dangerous*.

De San. Tu. l. 6. c. 9.

But lest I should seem unjust to drinking *Cold Water* on *antient* Authority (whatever good effects *Cold Bathing* may produce in other Persons) I have observ'd, that by ab-

abstaining from all *fermented* Liquors, and only drinking cold *Spring-water* in *Splenetick* Distempers, *many* Persons, and above all others a Learned *Knight* of my Acquaintance, not far distant, found *great* Relief, when all means *besides* prov'd ineffectual; and the hotter Baths had rais'd the *Symptoms* of the Disease almost to *Despair*. *Sir* G. N.

And as Water was the *antient* Drink, before Wine and *other* Liquors were invented; and rational Greatures, not so well *improv'd*, did in some things do the same with *Brutes*; which drinking *Cold* Water, and in great Heats entering the *River*, did satisfy nature in what was *requir'd*: So *Cold* Bathing, or the *Psuchrolusia*, before the *Thermæ* or *Hot* Waters were sufficiently known, did with greater ease obtain among the Antients, till a more *rational* account was given of the *Hot* Waters, and their *Uses* displac'd; as Persons of elder years were at *first*, from the example of our Blessed SAVIOUR, baptiz'd in a *River*, which afterwards gave occasion to the *Dipping-Baptism* in Persons of elder years, and baptizing or *Dipping* of Infants, when that Controversy was *decided* among the Primitive Christians, and so continu'd till *Decency* and *Order* was the reason of leaving *that* antient Usage; and the Church in after-ages acting according to the *general* Canon of

the Apostle [*Let all things be done decently and in order*] thought fit to order the *Font*, by which Sprinkling or *Affusion* of Water in Baptism at this time more *decently* continues, tho the former Custom of *Dipping* (or Immersion) be not prohibited. The *same* word is us'd in the *Book* of Canons 1571, where *Sacer fons*, not *Pelvis*, is order'd to be kept in *every* Parish Church, in which it ought to stand *Clean*, for the more *orderly* and *decent* use in Baptism; and Immersion is mention'd by the name of *Dipping* in the present Offices for Baptism *publick* and *private*, but not as *neveſſary* but *hazardous*, and therefore to be done *warily*; and the Reason given in the Rubrick, *because all Children may not endure it*, which cannot be fear'd in the *safer* way. And to touch a little *more* on Divinity, *De Fonte sacro*, sometimes mention'd in the *Antient* Fathers and other Writers more *recent*, sometime before the *fifth* Century (besides the Story of *Lucius*, which hath been too often *question'd*) may as *well* be understood of the Font, as the *River*, which contains much more Holy-water than *Holy-well*, or any *Bason* plac'd without, or in the Church, did *before* the Reformation; as the antient Church of *Litchfield* under so pious and *Learned* a Prelate, could have *better* informed such a noble Advocate and *Patron* of the *Baptists* and their Adherents, had they thought

thought fit to take notice of ſo *unkind* a Reflection on the preſent *uſage* of the Church, under the name of a *Friend*. Beſides, Baptiſm being a *Sacrament*, and to be done but *once*, cannot be any way *inſtrumental* in the Cure of *Diſeaſes*.

But to leave *Divine* work to *Divines* themſelves; the *Reader* may take notice, that for the greater Security and Benefit of the *Drinkers* of the Water here, there are firm *Leads* and good *Pumps*, that convey the Water *pure* from the Springs, without any *mixture* (which was *formerly* found) with the Water they *bath in*, which is foul, vapid and effete; whether ſo with them the *Author* may judg, if he pleaſe to read what was *formerly* written: *And here we drink the ſame Water we bathe in, as they do at the Bath.* P. 138. I hope not the *ſame* Water, but Water of the *ſame kind*, drinking the *ſame Water they bathe in* being ſtrictly forbidden by the *Phyſicians*, and carefully prevented by the *Government* at the Bath.

As to the *Grand Abſurdity*, as he calls it, practis'd at the Bath, *Of drinking the Water very hot from the Pump, whereby the Gas of the Mineral too much affects the Head, cauſeth Sweats, and is injurious to Aſthmatic and all hot Conſtitutions*; P. 63, 64, &c. The Author may conſider, that the *Steam* of the Bath is not the ſame with the *noxious* Gas of *Van Helmont*, but being only the

Volatile part of the Water, which he may call *Spirituous*; or if he like that *better*, the Vitriol of *Mars*, resolv'd by *Heat*, and clouded with a vaporous *Sulphur*, the more penetrating and *nimble* part of which may be so far from being *prejudicial*, that 'tis of great use to all *Asthmatic* and *Consumptive* Persons, and in other Distempers of the *Lungs* and Chest, which is one reason why the *eminent* Dr. *Radcliffe* frequents this Place. Whereupon the *antient* Physicians generally did send their Ill-breathing *Phthisical* Patients to a Hill nam'd *Tabiæ*, between *Surrento* and *Naples*, whose *Air* and *Milk* was commended by *Galen Vto M. M. c.* 12. and the *former* prefer'd before that of any *other* place, being impregnated with a *sulphureous* Steam that came from the burning Mountain *Vesuvio*, as the celebrated Practitioner *Sennertus* hath observ'd, in the Diseases of the *Lungs*.

I shall *further* add, that the Water of the *Hot Well* at *Bristol* deserves *greater* Commendation in that particular than *others* more remote: as, besides what I have *formerly* done on the same Subject, the *late* Collection of Cures, by a diligent *Observer*, makes plainly to appear, as in many other, so in those very *Diseases* I lately mention'd. In which Water, as the *Heat* comes not from *Fire*, but a *Fermentation*; the Minerals to which they owe their

Mr. Underhill.

their Virtues are rather *Salt*, *Sulphur* and *Niter*, than *Iron*, *Allum* or *Lime-ſtone*; the former, whatever may be ſaid of the *latter*, upon chymical Experiments faithfully made by the aſſiſtance of Mr. *Richard Millechamp*, then *Apothecary* in *Briſtol*, not appearing to ſatisfaction in the Contents drawn from conſiderable *quantities* of the Water on the Place. 'Tis much to be lamented that ſo *ſanative* a Spring had not a better *Situation*, that ſo the Water might *expand* it ſelf to the Formation of a *Bath*, which being moſt temperate in Heat, would be of greater uſe in all *Tabid*, emaciating and *Hectic* Diſeaſes, than any *other* Bath in the *Nation* beſides; which defect can only be *ſupply'd* by long Bathing-Veſſels of Wood, in which the Patient may lie at length with the *Head* above Water, and the Water *renew'd* as it begins to grow Cold. Such Baths as theſe were formerly *artificially* heated, to the degree of *Cow-hot-milk*, the *Balneum Aquæ Dulcis* being *inſipid Cold-water*; but the Heat of the *Hot Well* being *natural*, far exceeds any *Bath* can be made by *Art*.

I *add*, that the Objection made againſt taking Bath-water from the *Pump*, being founded on ſo *odd* a word as *Gas*; the *Gas*, *Blas* and *Archeus* of the *ſame* Author are as *unaccountable* to me, as the words of a *Conjurer* are when he calls for *Spirits*. But as to the *general* uſe of the Water in *poti-*

on; as what I *first* intended, was well receiv'd, and did *much* Good; so the *many* ill Accidents that have *happen'd* since, the confus'd Resort of *scandalous* Persons, *Vagabonds* and *Cheats*, on pretence to the *Water*, and the *packing* away of Patients *poor* and *incurable* by Physicians in other Places, have made me more *cautious* of commending or advising that *way* of Remedy, and with greater Satisfaction and *Credit* depend upon the Bath. Not to mention that the King's Bath *Dry Pump*, design'd for the use of Bathers, and others upon the *Place*, is now so *Wet*, as to look more like a *Brew-house* than a *Pump*, by sending away the Water in *prodigious* quantities; to the great *prejudice* of the City, as well as those that stand in need of *that* Bath and the *Pump*.

And whereas the Bath, in *former* times discreetly us'd, did *quicken* the Circulation, promote *Nutrition*, cure *Atrophies*, strengthen *Weaknesses*, confirm *Relaxations*, and relax *Contractions* of the Tendons, and all the *nervous* Tribe; the *nutritive* Juice and relax'd *Paralytic* Fibres are now so *diluted* and beyond all measure *soften'd*, with a *Deluge* of the Waters taken *inwardly*, that whatever *good* it may do Persons in *statu neutro*, neither *sick* nor well, the good effects were wont to be produc'd by *external* Applications of the *Water* to the parts affected, are now *frus-*

trate, Cures not ſo *numerous*, and if any, perform'd in much *longer* time, ſince the uſe of the Bath hath become ſo *much* inferiour to the *drinking* of the Water: and the Diſeaſes were *formerly* cur'd, according to antient method, *ſafely*, *quickly* and *with eaſe* to the Patient, muſt now expect the *Omnipotent* means that *firſt* attended the propagation of the *Chriſtian* Religion, and not a *Cure* without a *Miracle*.

Should I proceed further to *diſcover* the great Miſchiefs and *Inconveniences* that accompany the late uncouth *apiſh* practice of Phyſic, not only here, but in *London* and *other* places; I might perhaps be thought to do it out of *Pique* or *Deſign*: whereas I do *bona fide* declare, that I write this out of no *other* regard than to the *Truth* of Obſervation, and the *general* Good of the Race of Mankind, for which all *Hot* Waters were at firſt *created*, by the wiſe Maker of the *Univerſe*; but the Bath oftentimes *interfering* with drinking the *Water*, a general Good cannot be obtained, till both are made and kept diſtinct.

To ſome *undecent* Expreſſions elſewhere, that caſt a *Livid* Aſpect upon me and my *Writings*, I ſhall at *preſent* ſay no more than *this*, that I have fram'd a ſufficient *Anſwer*, as my Friends well know, which I was unwilling to make *public*, by giving further Trouble to an *antient* Man in his way to *Heaven* and the Joys of *Eter-*

Memoirs of Bath, p. 24, *&c.*

Eternity. But to do the *Right* I owe, and that most deservedly, to the Memory of the *deceas'd* learned Dr. *Highmore*, the Character of *Dictis & Gestibus officiosis*, mention'd in the famous Dr. *Maplet*'s elegant Epistle to Dr. *Needham*, *in Therm. Britan. p.* 361. whoever it may belong to, could never suite with *him*, who was so far in his own nature from an *over-officious* Demeanour, as he never had any Circumstances of Life as did *require* it, being *Wealthy*, *Learned* and *Grave*.

In the Preface to his excellent Book, *Disquisitio Anatomica*, this *Character* he gives of himself, which I knew to be his *Temper*, and is my own in *part*, *Non vanum & ambitiosum scribendi Cacoethes me possidet, non Vulgi acclamationes ambio nec contemptus metuo; sola mihi placet Veritas*. I have no vain humour or *ambitious* itch of writing Books; I seek not the *Applause* of Men, nor fear their *Frowns*, only *Truth* is what I aim at. And tho *Riolanus*, the *supercilious* Professor at *Paris* and Dean of the Faculty, a *proud* and profess'd Enemy to the *Fame* of all *English* Physicians, as well as to the *Renown'd* Dr. *Harvey*'s Circulation *now* establish'd, thought fit *in Opusculis Anatomicis*, to treat Dr. *Highmore* with no greater Civility than that of a *Lunatic*, haughtily asking *where the Moon was*, when he writ his *Anacephalæosis*, or Summary of the Book *mention'd* before, de-

dedicated to that excellent Perſon Dr. *Harvey*: Yet others, eſpecially, *High Germans*, *Dutch*, *Danes* and *Swedes*, admired him, and ſome under the name of *Higmore*, the Letter *H. in medio*, being never very current in *Foreign* Parts.

Jacobus de Back, a Perſon of good *Repute* in *Holland*, in his Diſſertation *de Corde*, printed at *Roterdam*, calls him *a moſt diligent Searcher into Nature.*

Johannes Antonides vander Linden, the Learned Profeſſor at *Leiden*, and much in favour with the moſt Learned *Golius*, that *Arabic* Oracle and admir'd Linguiſt, *in Medicina Phyſiologica*, *c.* 9. *p.* 456. gives him the Character of *a moſt famous Man, and accurate Anatomiſt, Qui palmam meruit ante omnes*; *& M.P. c.*9 §. 6. *docuit nos hoc primus Cl. Highmorus*, I learn'd this firſt from the famous *Highmore*. *Joannes Alcidius Munier in Preluſiunculis ad vaſa Lymphatica Bartholini*, printed at *Genoa*, ſtiles him, *The Lynceus, Lynx, and quickſighted Eagle in Anatomy*. The very learned Phyſician, Philoſopher and Divine, Dr. *Thomas Bartholinus* (my Friend) Son of *Caſpar* a *Dane*, ſometime *Regius* Profeſſor at *Copenhagen*, and Dean of the Faculty, who ever ſince he was in *ENGLAND*, and ſaw our Univerſitys about the year 1640, was, as now is the Learned *Jacobus Gronovius* at *Leiden*, very *kind* to the letter'd Men of this Land, *in de Lact. Thorac.* hath theſe words; Pag. 69.

words; *Nathaniel Highmore*, *an* Englishman, *hath of late years been an accurate Writer, and exceedingly well vers'd in the Dissection of Animals. Olaus Rudbeck*, a *Swede*, refers often to *Highmore*'s Cuts, very *curious*, and answerable to those of the *great* Anatomist *Vesalius*; only in *Hum. Corp. disq. Anat. par.* 2. *Tab.* 77. *g. g. g. p.* 39. *&* *Tab.* 111. *p.* 4. *a. a. a. b. b. b.* the *Venæ Lacteæ* upon the *Porta* from the *Pancreas* to the *Liver*, are mistaken for the *Lymphatics*.

Fredericus Ruysh, M. D. and (now) Professor of Chirurgery and *Botany* at *Amsterdam*, the ingenious *Author* of *Dilucid. Valv. p.* 35. from Dr. *Highmore*'s *Fig.* 11. *Tab. X. collects* the longer *Valves Higmorum prorsus latuisse*; and in his 22*d* Observation refers to *Higmore*'s *Tab. VII. Fol.* 62. Also *p.* 65. *Higmorus celebris ille Britannus*, Higmore *that famous* Englishman. The same skilful *Anatomist* first discover'd a *new* Artery, call'd *Bronchialis*, which conveys Blood from the *Great* Artery to the *Lungs*, by the means of which *Circulation* there is more plainly understood, than by the obscure *jingling* names of *Arteria venosa*, and *Vena Arteriosa* of the *antient* Physicians, which indeed are but *Veins*. This new *Artery* is evidently exhibited with the *Bronchia Pulmonum*, in a curious *Copper* Cut, *D. V.* printed at the *Hague. ex officina Hermani Gael, A. D.* 1665. *p.* 70.

Fig.

Fig. IX. I had a kind Salutation with a *Preſent* of the Doctor's Anatomical and Chirurgical Obſervations, made *ſince* the former, with *many* large Copper Cuts in 4*to*, and an account of the *Curioſities* contain'd in his *Muſæum*, ſent to me *lately* from *Amſterdam*, where he is Phyſician in Ordinary to that Republick. On the Diſcovery of this new Artery, a Friend wrote theſe Verſes.

Pulmoni nunquam veteres tria Vaſa negarunt,
Cunctis nota ſatis; Ruyſchius arte valens
Nobile Vas profert quartum, quo fertur ad ambos
Pulmones, ſanguis nobilior riguus.

Which I thus made Engliſh;

The Antients Conduits three to Lungs did grant,
But did till now a fourth Veſſel want;
The famous *Ruyſch* found this noble Good,
By which the Lungs obtain a nobler Blood.

Con-

Concerning Heat *in the* BATH.

HAVING thus *discours'd* of new Inventions in *Foreign* Parts, whether a *better* Cause of the Heat of *Hot* Baths than *Fire* hath been *lately* discover'd by some *nearer* home, I shall submit to the Judgment of the Candid *Reader* in this Paragraph, as the *last* Digression.

Not long after the *Death* of the learned Dr. *Jorden*, who gave the greatest *damp* to a subterranean *Fire*, another *Person*, much of his Opinion, advanc'd a *farther* account of the Heat of the Water of the Bath, to *this* effect: I come now to the Waters *Heat*, the cause of which being *variously* debated (for Water, from an *internal* Principle, is not *naturally* Hot) hath exercis'd the Minds and *Pens* of many men already, and may *many* more for the future. The *difficulty* of the thing was the *reason* why most Writers of the Bath have *either* pass'd over this important matter, or insisted on *Causes* no way probable, if not *broach'd* Opinions of a *monstrous* Nature.

For besides a *Fire* under ground, which was the constant Opinion of the *greatest* part

part of Writers in *former* times, but confuted by later Authors *: Some Philoſophers have attributed *Heat* in the Waters of the Bath to the *Beams* of the Sun, and call'd the Waters, *The Waters of the Sun*, the Deity *Minerva*.

Some have made the *Cauſe* of the Heat, Wind, or a *Spirit* inclos'd and impel'd within the *Bowels* of the Earth; *others* Quick-lime: Some Lime-ſtone, and the violent motion of the Waters; with *other* Cauſes as *ridiculous* as the former.

What ſeems to me moſt *rational*, is, "That Metals and Minerals, contain'd in "the Earth, have their Seminaries en-"dow'd from above with Spirits and "Faculties ſubſervient to Generation; "and meeting with convenient ſutable "matter, work on it ſo as to corrupt "the former, and reduce what is alter'd "to a more exalted active Subſtance.

This *Operation* cannot be made without the help of *moiſture* and *motion*; the firſt is a *Paſſive*, the ſecond an *Active* Principle.

There muſt alſo be *variety* of matter,

* Quod aliqui ignes ſubterraneos fingunt, citra rationem fit, cum ſine aere libero ignis nuſpiam ardeat. *D. Geo. Ent. Apol. pro Circ. S. p.* 88.

Omnis ignis duo deſiderat, alimentum & ventitationem; quorum alterutro ſi defraudetur, extinguitur. *Id. p.* 96.

of

of which *all* Minerals do generally consist; and the Water, coming *Cold* from divers Places, brings with it many mixtures of *different* Natures; all which, joining in the *Mineral Matrix*, generate *Heat* by Ebullition or *Fermentation*.

'Tis necessary *also* that the Water in some Places be affus'd in *greater* quantity, in others *less*; in some *near*, in others at a *distance*; in some *direct*, in others thro *crooked* and more *winding* Passages: by which the Heat *varies*, and becomes more *intense* or *remiss* in several Places, as in the *King's*, *Cross* and *Hot* Bath's at *Bathe*.

A good Argument of *Activity* are frequent *Bubbles* perpetually *arising* from the Springs of the Bath, occasion'd by the *motion* of bituminous and sulphurous matter in the Mineral Bed *beneath*, which meeting with *Acre* above ground, appear on the *Surface* of the Bath in such a *Form*, as the Breath usually makes by motion upon *Common* Water, or the *Hand* with a mixture of ordinary *Soap*.

All these *Requisites* to a natural Mineral *Hot* Water, not meeting in *Mines*, is the reason why Baths are not so *frequent* in places where *Metals* and *Minerals* do more abound; only great *Heats* are observ'd there, which in *defect* of Water, the Air many times *improves* into a *Flame*, which hath never *yet* been known at the Bath.

This

This is the substance of the *new* Hypothesis I formerly *publish'd* in a Treatise of the Baths of *Great Britain*; and if any love *Fire* better than a *Fermentation*, they have my Consent to remain *perpetual* notional Salamanders for the *future*, and shall *ever* live for me without disturbance in *that* Opinion.

And now, Sir, having made a *Civil* Enquiry into the *Enquiry* of Sir *John*, and consider'd all the *Considerables* that reflect on the *famous* and deservedly celebrated *Hot* Waters of *this* City, which was the *chief* design of writing this *Apology*; I think *this* enough to let you know, that whoever hath the *Latin* Pen, I have *English* sufficient to express a *former* real Esteem, and acquaint you that I continue,

SIR,

Your Faithful Friend

and Servant,

Tho. Guidott.

THE POSTSCRIPT TO THE READER.

THERE hath been, *kind* Reader, *another* Book lately publiſh'd by the Author on the ſame Subject, with *Auxiliaries* of Foreign Aid, and *ſome* Deſerters from the Bath, who might have done a *wiſer* Act than aſſiſted an *Enemy* to the Place, whence they expect an Annual *Income* to maintain their *Ingratitude*. I have *perus'd* this, and account it much more Candid, and *better* penn'd than the *former*; but the Arguments *there* us'd, beſides *bare* Authority, *doubtful* Certificates, *Reports* and witty *Stories*, carrying the matter no *higher* than the *Enquiry* hath done, I thought fit to refer the *Reader* for an *Anſwer* to that to the

the *Summary* I have made, *pag.* . of this Apology, where all the Favour any *rational* Man can *allow* Cold Bathing, with its Benefit, is expres'd: which agrees with the *hot* Bath chiefly in *this*, that both are *natural*; but moderate *Heat* in its own nature being generally esteem'd of greater *use* to preserve *Life* than its *Contrary*, the *same* degree of *Benefit* cannot be expected from the *One*, as may be found in the *Other*.

And as to the *Cures* are said to have been done by the use of the *Cold* Bath, 'tis too well known to be the *common* Artifice of all *Quacks* and *Empiricks*, who ought to be at *greater* distance from *rational* Physicians, to create a *good* Opinion in the Admirers of their *Medicines*; and if every *Mountebank* on a Stage, to which the Learned *Author* is a Stranger, should give himself the *Trouble* to require a *Certificate*, true or *false*, from all his Patients, with *Hear-says*, *Letters* and merry *Discourses*, they would *swell* into a Volume of *twenty* times the bulk of *both* those Books. If *Reason* answer not *Experience* in some proportion, the matter is more *Empirical* than *Rational*; tho Experience go before, *Reason* must follow; and opening and *shutting* the Pores having no more relation than *Contraries* can have, the comparing of *both* will declare

the difference; which with great *exactness* is already done in the *Second* Letter to a competent Judg, the most worthy Dr. *Fowk.*

In short, the noble Doctor, in his last Discourse of *Cold-bathing*, hath sufficiently *shown*, that he hath read much, that he is well vers'd in Authors *Antient* and *Modern*, *Popish* and *Reformed*, *Authentic* and *Legendary*, *Good* and *Bad*; among the *last* of which our best Historians and *Divines* generally account *Polydore Virgil*, a Corrupter of our *English* History, a great *Waster* of the Churchstock at *Wells* (where he was sometime an *unhappy* Archdeacon) and Collector of *Peter*-pence under the Pope, in the time of *Henry* VIII.

The same *excellent* Person hath given a *clear* account of the *early* use of Cold Bathing, *before* convenient Places were
P. 45. made, and the *Thermæ* or *Hot-waters* were better known, which seems to have been in *great* measure since the year 1400. For tho Hot and *Cold* Baths were known and in use before and *after* Christ; yet on the decay of Learning by the Downfal of the *Roman* Empire, they for many years lay *neglected* and obscure; till the *Arabians*, chiefly *Avicen* the Prince of *their* Physicians, about the year 1000, among other parts of Medicine, *reviv'd* that sort of

Knowledg,

Knowledg, which other learned Men in after Ages examin'd, *illustrated* and much more advanc'd, when the use of *Hot* Baths, as *Baccius* observes, was almost *obliterated*, and had been little better than a useless *Cypher*, or Supernumerary in the *Creation*, could *Cold* Water have done the *same*, or as much *Good* as the *Hot*, which was the extraordinary *Gift* of *God* to *Man*. De Therm. l. 2. c. 1.

This restoring of hot Baths to their *former* use was long after the time of *Constantine*, who died in the fourth *Century*, and went to *Nicomedia* in hopes to receive Benefit in his *old* Age, from the *Hot* Baths there, where he was *baptiz'd*.

To clear the matter concerning the *Baptism* of this *pious* Emperor, not rightly represented by the *Author*, I find from Greek Ecclesiastical Story of *undoubted* Credit, that about his Age, and the time *when* he died, there is no Agreement.

The most *positive* Author is *Socrates*, who in the last words of his *first* Book, says thus: "The Emperor *Constantine* "liv'd threescore and five years, he "reign'd thirty one, and died the two "and twentieth day of *May*; *Felicianus* "and *Tatianus* Consuls; the second year "of the 278 *Olympiad*.

This Year, according to the *Compute* of *Helvicus*, falls on the year of our Savi-

our's Nativity 337; according to *Simon Grinæus*, and his Continuator *Paulus Phrygio*, an *old* Chronologer, whose *Æra Christi* commenceth later, 338. For as the *Fasti* and *Olympiads* do seldom agree, so there are some few years *difference* in dispute among the Writers of the *Reign* of this Emperor.

Concerning his *Baptism*, *Eusebius* Bishop of *Cæsarea*, who liv'd at the same time with him, and wrote his *Life*, delivers; That coming to the Suburbs of the City *Nicomedia*, and having assembled the Bishops, he spake *thus* unto them.

Brethren,

"The Salvation I have earnestly desir'd "of God these many years, I do now "this day expect: It is time therefore "that we shou'd be seal'd and sign'd with "the Badg of Immortality. And tho I "purpos'd to receive it in the River *Jordan*, in which our Saviour, for our example, was baptiz'd; yet God knowing what is fittest for me, hath appointed that I shall receive it in this place: "therefore let me not be delay'd. And if "he, in whose power Life and Death are, "will permit me to live any longer a-"mongst you, and to join my Prayers "with the Prayers of the Congregation "of God's People, I will live in such a

"regular

" regular manner, as may become the " Servant of God. Thus he spake, and after the *Service* of Baptism was read, they (not the *Pope* or the *Arian*) baptiz'd him, with all the *Ceremonies* belonging to this *mysterious* Sacrament.

Another *Historian*, whom I have translated from the Original Greek, that there might be no *mistake*, affirms, That *Constantine* finding a *Decay* in himself, and willing to use the *Hot* Baths for some time, abode at *Nicomedia* [about 60 miles from *Constantinople*] in a certain *Manner* without the *Walls*, where he was baptiz'd in the Faith of CHRIST, in which he *greatly* rejoic'd. After he was baptiz'd, he *prais'd* God, and said,

" Now I know that I am happy, that I " shall enjoy an Immortal Life and the " Presence of God; the Privation and " Loss of this Happiness, is the greatest " Misery.

He died at the Feast of *Pentecost*, which we now call *Whitsontide*; and was bury'd at *Constantinople*, in the Church of the *Apostles*, which he built, and therein erected his *own* Monument, being a *Tomb* in the midst of *twelve* Pillars, in Honour and Memory of the *twelve* Apostles, which stood on each side of his Tomb, *six* on a side, being unwilling that any one of them he so much *honour'd*, should be plac'd at his *Feet*.

Having given this *Account* of the *Baptism* and *Death* of *Constantine* from the *best* Authority, I return to the *Author's* performance in his *later* Discourse of *Cold*-Bathing, and acknowledg, that with great Industry he hath reviv'd an antient Custom, but not destroy'd a *later* Usage; the Hot Baths enjoying *still* the same Virtues with which they were at *first* endow'd, having many advantageous *Minerals* in conjunction with *Heat*, that are not to be found in SIMPLE Water *Cold*; which, notwithstanding all *Endeavours* jocular and *serious* to support its use, may not prejudice the *Hot*, since the great *Wit* of the noble *Galba* met with an allay from a *mean* Habitation, which a *stately City* doth advance; and as *Tully* said of the eloquent *Hortensius*, whom the *Roman Forum* call'd the *King of Causes*, *A good Orator may sometimes espouse and defend well an indifferent Cause, but never make a bad One good.*

And as it hath been *lately* thought reasonable in *Spirituals*, that there ought to be no *halting* between a Conventicle and a *Church*; so 'tis advisable in *Naturals*, that those that admire *Cold* Water so much, as to blow *Wind* into the *Carcase* of an *antiquated* Custom, *forbear* the Hot, or endure the distinction of *cunning* Jug-

lers,

lers, that blow *Hot* and Cold, *contrary* Breath out of the *ſame* mouth, which hath in *great* meaſure undone the Practice of Phyſic *here* and *elſewhere*; ſo that what was *formerly* ſaid of *Rome* *, may better agree with the noble Art of *Medicine* in ſo flouriſhing a Condition for *many* Ages paſt; which tho now fallen into the hands of the *Enemies* to Learning, *Goths* and *Vandals*, Empirics and *Quacks*, ſuffers *moſt* from *inteſtine* Diviſions, and its *own* Members; as is well obſerv'd in the *firſt* part of an *honeſt* Letter from the ingenious *Dr. Baynard*, *Poſtſcript*, *p.* 207. who very *kindly* hath commended *drinking* Water on the *Place*, and more than *others*, ſupported the Dignity of the Faculty

* Viribus ſuis ruit.

I have not time now to examine *Quotations*, or know how far the *Comment* exceeds the *Text*, but ſhall make *this* Remark upon the prudent *Roman* Emperor *Alexander Severus*, who drank *cold* Water, liv'd long, *was in Britain*, and ſo much commended by the *Author*, that two Emperors of the *Weſt* had the name of *Severus*; *Septimus Severus*, who *began* 195 after Chriſt, and *ended* at *York*, 4 *Feb.* 210, as *Dio*; and *Alexander Severus*, Son of *Mammæa*, *cœpit* 222. *Conſul* with *Dio Caſſius* 229. a very hopeful *young* Prince, but *murder'd* with his Mother, 18 *Mar.* 235, as *Lampridius* and *Dio*, and *never* was in

Cold Bathing, p. 201.

in *Britain*, which the Author affirms. The Letter which follows from the Learned *Divine*, collected out of Bishop *Godwin* and other *Authors*, is becoming an Antiquary, *Orthodox* and *Serious*.

I have written this as my *last* kindness to the *Bath*, to which in some measure I may apply the words * of the unfortunate *Learned* Dr. *Jorden* concerning Allom; *The greatest Debtor I have, and I the greatest Benefactor to it.* What *spare* hours I may have for the *future*, I shall employ to prepare for the *Publick* a more bulky work in *Latin*, being the *Annals* of this City, and the *History* of *Wells*, with the *Succession* of the Bishops and Deans of that Church, from the first Foundation to the *present* time; which may prove of greater advantage to the *World*, than to wast precious *Minutes* about *other* things of a *meaner* Concern. Only as to *drinking* the Waters at the Bath, in *former* times; besides, that honest Physician Mr. *Jones*, who writing his *Bathes-Aide*, mention'd *drinking the Waters* above 120 years since, and gives some Directions in order to it. Dr. *Tobias Whitaker*, the great *Physician* at *Norwich*, about the time of the *prodigious* parts of Sir *Thomas Brown*,

Lib. 4. Fol. 29.

* *Discourse of* N.B. *and* M. W. voce Allom.

in

in his *Manual*-Diſcourſe of Waters, printed at *London*, 1634, debates the uſe of Mineral Waters *inward* and outward, with a *ſolid* Judgment, but is of Opinion, that the *inward* uſe of Mineral Waters is more *doubtful* than the *outward*, eſpecially being to be receiv'd *into* the Body; and joins iſſue with Dr. *Jorden* as to drinking the Water at the *Bathe*, in the words that follow: P. 107.

"Our Learned Countryman of the "*Bath*, in his Diſcourſe of *Mineral* "Waters, altho his affection to ſuch "Springs perſuades him of much good "uſe that may be made of them, if they "were taken inwardly; yet becauſe of "his Fear [which *Fear* is remov'd in "this Apology] of ſome mixture with "other Waters, which may iſſue into "'em, for this Cauſe only he proteſts "he dares not adviſe the inward uſe. He "farther writes, That Bathing in Salt- Pag. 92. "water is ſomewhat allow'd by *Avicen*, "to cure the Itch and Scabs; but *Hip-* "*pocrates* in many places proteſteth a- "gainſt it, and ſo doth *Avicen*, who af- "firms *the Remedy more noxious than the* "*Diſeaſe*. I could have been longer upon this Subject, but *Buſineſs*, *Indiſpoſition*, and the want of an *Amanuenſis* conſtrain me to be *ſilent*.

Καὶ

Καὶ τᾶυτα μὲν δὴ τᾶυτα.

Out of the *Epistles* sent to me from *Foreign* Parts, I shall insert *one*, being the *First* I had from the *Learned Jacobus Gronovius*, who did me the *Honour* to take the care of printing my *Theophilus* in that late neat Edition at *Leiden*. Mr. *Nicholas Lloyd* he *mentions* was my Chamber-fellow in *Wadham*-College, *Oxford*; and the *first* occasion of our Acquaintance was a passage in his Elaborate, Historical, Geographical and Poetical *Dictionary*, printed by *A. Churchill* and others, 1686. at the word *Æsculapius*.

The Letter I publish out of *Gratitude* to *Gronovius* (who sent it to me on the receit of my *Book*, *De Thermis Britannicis*) and remembrance of our *absent* Friend, who died *too* soon for the Learned; *rather* than to any thing else may be in it, relating to my self.

Præ-

Præstantissimo Viro

D. Thomæ Guidotio,

Jacobus Gronovius S. D.

AN tanta humanitas politam mentem tuam obsidet, ut post tot Lustra, post Arbitrum notitiæ nostræ exstinctum, mei etiam meminisse pergas, idque tam benigne, ut opineris te mihi placiturum, si lætos studiorum tuorum Fructus offerres? Agnosco ἀνεξαιότητα *dignam illa vetere Elegantia tua & Musis tam inoffenso cursu ac lepore cultis & continuatis. Vix mihi Vox ad describendum animi mei motum in tam inopinato vel Nominis tui auditu, vel Manus conspectu, quo utroque nihil potuit mihi gratius contingere. Redeo libentissime tecum in præterita, & illos serenos Oxonienses dies, te Auctore, cum maxima hilaritate revolvo. Utinam ille unus Dolor non interveniret, ac tranquillum hoc Gaudium non turbaretur Desiderio istius Doctissimi & Candidissimi nuper nostri Lloydii! Ad hanc mentionem testor Lacrymas tenere me non potuisse: adeo arcte me perseverat recordatio*

cordatio immensæ jacturæ; & quanquam fatear exsultare potius me debere ob istius exigui temporis usum, tamen illa tam multa, quæ mihi spondebam ex pulcherrimis ejus propositis, sic ablata & rapta per omnem vitam dolebo. Tanto magis etiam exoscular suavitatem tuam, qui renovatione hac amoris tui, & solaris & jucundiorem longe denuo reddis memoriam istam. Scio & recordor optime, inter nos interprete Lloydio τῷ Μακαρίτῃ constitutam familiaritatem; sed illam calefacere toto medio tempore nequivi, vel propter desultoriam vitam, & annos forsan nimis multos profectionibus deditos; vel quod postquam Deus me in solido stabilivit, circumspiciens quorum benignitati fatebar me esse adstrictum, quum multa tibi accepta retulissem, nesciebam quo te, Honoratissime Amice, detulissent fata, quæ ut semper optavi, etiam nunc & diu fausta & propitia tibi ac domui tuæ, si quam tibi propriam & pignoribus firmam fundavisti ex animo precor. Æsculapius tuus nequaquam me fugit, qui utique debetur publico postquam prædem ejus se obtulit ille tibi, ille mihi tam gratus optatusque quondam Lloydius: cujus manes precor ab fallacia ut liberes, & quod certe scio plurima me aliosque doceas. Quod collata in Patriam tuam Dei munera inspicis, & operose etiam illustras, sane negotium est undiquaq; favorabile, & omni laude dignum; præsertim quum tam solerter & industrie singula aggrediaris, tanto excellentius, quod in banc

partem

partem primus te incitas, & quidem ita ut pariter videatis consummare. In quo sicut liberalitati tuæ summas ago gratias, non tam quod Librum possideam quam quod tua ope & indulgentia discere mihi licuerit quod volupe est; ita eum librum hic & ubique celebrabo, ac notum faciam nominiq; tuo admiratores conciliabo; neq; desinam posthac mea ludicra ex æquo tecum communicare, ut sic saltem quod residuum nobis est vitæ, prout in hoc corporum discidio licebit in sinu mutuo deponamus. Perge, perge, admirabilis Guidoti, elimare etiam Batbonienses Antiquitates, & ex Thesauro tuo scientiam publicam auge & instrue: Si quid ex his terris tibi opis, aut etiam amabile potest per me evenire, persuade tibi, eam rem a me bona fide effectum iri, & pro ingenti munere habiturum. Deus præclaris tuis inceptis faveat, valetudinemque tuam curæ habeat, quod ex animo comprecor,

Honoratissime &
Eruditissime Guidoti,

Lugduni ad Rhenum
die Octob. XXII.
M. DC. XCVI.

Tibi Obsequentissimus,
Jacobus Gronovius.

Eum qui tibi has deferet ardenter commendo; quod si feceris, ut ille intelligat, næ magnopere me hoc etiam genere devinxeris. Iterum vale.

In

In English;

SIR,

CAN so much Goodness possess your Breast, as that so many years after the Death of the Middle-man, that brought us first acquainted, you should still continue to remember me, and so kindly too, as to oblige me with some Fruits of your Studys? I acknowledg the purity of the Latin Stile, and Elegance may vye with that of the Antients, in which the Muses join with so much Gaiety and Air, as render it easy and belov'd of all.

I have not words sufficient to express the motion of my Mind on this surprizing accident of hearing your Name, and seeing your Hand; both which were so acceptable to me, that nothing could be more.

I most willingly reflect upon the time that is past, and call to remembrance with greatest Delight those serene days I spent in *Oxford*, of which you were the Cause.

I wish the only Grief I ever had since, had not interven'd to disturb my rest; I mean the Death of our most Learned, Candid *Lloyd*; at the mention of whose name,

Name, I can hardly forbear Tears, so close the sorrowful thoughts for that great Man's Death do sit upon my Spirits. And tho I confess I have more reason to rejoice, in the use I then made of that little time I spent among you; yet being now disappointed of the many Performances I expected from his grand Designs, I shall never cease to lament that Loss as long as I live.

So much the more reason have I to kiss the sweetness of your Nature; who, by renewing former Love, do comfort me, and render his Memory more pleasant unto me.

I well remember, Sir, our Friendship and Familiarity was first began by the means of the blessed *Lloyd*; but by reason of my uncertain way of Living, and the many Travels I have had since, I could not keep it warm by such a Correspondence, as otherwise I would have done.

But when by God's Providence I came to be better settled, and casting about to whom I was oblig'd (for I acknowledg the many Favours I receiv'd from you) I could not tell, most Honour'd, how or where you had dispos'd of your self; to whom as I ever wish'd well, so now again most heartily pray to Almighty God, to send all Prosperity and Happiness to your self and Family, if you have any

made dear unto you by a Wife and Children.

I am not a stranger to your History of *Æsculapius*, which you owe to the Publick, after our mutual beloved *Lloyd* had made such a faithful Promise, and engag'd it for the Press. I desire you would free his Memory from Fraud by a Publication; out of which History, I'm certain, as well as others, to learn many things my self I know not yet.

That you spend some time in taking notice of the Gifts of God to your Country, which with such great Pains and Learning you illustrate, is a Design very laudable, and deserves all Commendation; and the more, because with so much Care and Industry you pursue Particulars; and that with the greater Glory, because you seem to have begun and ended the Subject of the famous Baths of *Great Britain* at one Attempt.

And as I give most humble Thanks to your Liberality, not so much that you made me Partaker of the Book you sent me, as that by your Help and Indulgence I can now learn thence what I would desire: So I shall celebrate and make known the Book to the Learned World, and procure Admirers of your Name and Learning here and elsewhere.

Neither

Neither shall I ever cease to communicate the Products of my Studies, that so what remains of our Lives, so far forth as this distance of Bodies will permit, may rest and lodg in one another's Breast.

Proceed, go forward, admirable *Guidott*, to polish your Antiquities of the *Bath* and City; increase and furnish publick Knowledg out of the Stock and Treasure you have within: If you fancy any thing in this Country can be perform'd by me for your Good, it shall not only be faithfully effected, but esteem'd by me as the greatest Honour.

That God would add his Blessing to your Studies, and preserve your Health, is the hearty Prayer of,

Leiden, Octob. 22. 1696.

SIR,

Your most Obedient,

James Gronovius.

FINIS.

MVSEVM
BRITAN
NICVM

Errata & Addenda.

PAG. iii. lin. 5. r. *Doctissimi Viri.* P. iv. l. antepenult. r. *sesquipedali.* P. xvi. l. 3. r. *Pope Sylvester II.* P. 2. l. 13. *Propylæum.* P. 13. l. 9. *predominio.* P. 31. l. 20. *Ebusinæ.* Ib. l. 22. add, *The like was observ'd by Sir* Th. de Mayern, *in one that piss'd Blood, in whose Urine,* when Cold, *was a white Concretion,* Gelatinæ potius quam sanguini affinis, *Prax. l.* 3. *c.* 17. P. 33. l. 2. r. *more Worms than there are Men upon Earth.* P. 36. l. 7. after *Cold,* add, *which makes good the Observation mention'd before in* p. 31. P. 49. l. 14. *Mothius.* Ib. l. 15. *Fuicru.* P. 57. l. ult. *Trincavellius.* In Note at bottom, r. *Theoph. de Urinis, Gr. & Lat. c.* 5. *p.* 78. *de Diabete.* P. 76. l. 20. *magnæ.* P. 84. l. 16. *discreetly and warily.* Ib. l. 19. after *way* add, *Upon which the Reverend Dr.* Comber *on the Liturgy, says, that* Sprinkling *in Baptism is not enjoin'd by the Church* Establish'd, *but for Reasons I have given,* permitted *to be done.* P. 86. l. 31. after *mention'd* add, *having not only done right to the hot Waters of that Place, but deservedly commended the good Government of the City.* P. 91. l. 21. *Prolusiunculis.* P. 96. l. 20. *Air.* P. 99. l. 1. add 74. P. 105. l. 26. *Septimius.*